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RELATION OF COLLEGIATE TO MEDICAL STUDENT SCHOLARSHIP*

JOHN WYCKOFF

University and Bellevue Hospital Medical College

When selective admission to medical school first became necessary because of the large number of applications, it was the hope of all medical educators that proper selection would result in general, in a finer type of physician. Obviously, three requirements are fundamental: mental equipment, physical equipment and that quality so difficult to define—character. While it is undoubtedly true that a poor or mediocre student, if he has unusual character, will make a better physician than a man of high scholarship with less character, still, there is a minimum of mental ability that is essential if he is to carry the medical curriculum.

I have made a study of the correlation between collegiate scholarship and the ability of the student to complete his first year of medical school. For the sake of emphasis, I want to say that we do not believe that the ability of a student to complete his first year will necessarily make him a good physician. We all know that too many students complete the full course who never can become physicians of the finest type. On the other hand, we believe that the usual wastage, which comes from a large percentage of failures at the end of the first and second year, is partly unnecessary and should be avoided, if possible, by the choice of students mentally capable of maintaining the standard required by the medical school. Every one who has served on a committee of admissions has had the experience of being told that students who have done poor or mediocre work in college will frequently do excellent work when they arrive at the professional school because of its direct application to their chosen profession. Because of this current belief, poor students of pleasing personality are often admitted. This study was made with the hope of throwing some light on the truth or falsity of this belief.

In 1919 the number of applications from students eligible for admission to New York University Medical School was greater for the first time than the number of students who could be admitted. This first year only two or three applicants had to be rejected, and in 1920, a few more. It was not until 1921 with the admission of the class of 1926, that the number of students rejected was so large that a definite plan for selection became necessary.

With the class of 1926, in the Fall of 1921, all students were for the first time passed on by a committee of admissions; the selection was made after a consideration of the scholarship and personality of the student. Personality, as judged by this committee, was at that time

*Read at the Thirty-Seventh Annual Meeting held in Cleveland, Oct. 25 and 26, 1926.

the greatest factor in the acceptance of any student. During the summer of 1922, a preliminary survey was made of the students who had been selected during these three years, and it seemed that little or no benefit had resulted in the character of work done in the first year of medical school by our selected students. It seemed necessary, therefore, to make studies to see on what basis students could best be selected. This paper is the preliminary report of certain of those studies.

The medical department of New York University receives its students chiefly from New York City. Of recent years the majority of the students come from the collegiate department of New York University at University Heights, the collegiate department of New York University at Washington Square and from the College of the City of New York. A few students came from Columbia, Cornell and Fordham Universities. About 20 per cent of each class comes from colleges outside of the city of New York. In determining a method of selection, three obvious groups presented themselves; first, a group of New York University students; second, a group of students from the College of the City of New York, and third, a group of students from outside the city of New York. From the very beginning a much larger number of students applied for admission from the College of the City of New York than from any other college. At once, it was decided that only a certain percentage of these students could be accepted and it was decided that they should be accepted on a purely scholarship basis.

Students from the collegiate department of New York University, of which we are a part, were all accepted if they met the minimum requirement for admission, and they were so accepted for the first year of the experiment. Students from out of town colleges, because the committee desired to have as large an out of town representation as possible, were accepted for the first two years on personality if they met the entrance requirement. During the last two years all students have been accepted on a basis of scholarship primarily, and during the last year only scholarship has been taken into consideration in accepting students.

A qualifying clause is necessary here. During the last year all A, A- and B students were accepted; C- and D students were all rejected. Personality was only used as a factor in selection in the large group of borderline B- and C students. We, therefore, have for study the three different groups of students who during a four year period were accepted in different ways until the final year when they were all accepted upon the same basis.

During the period of experiment we were further able to divide our students into groups of college scholarship. We have made eight such groups A, A-, B, B-, C, C-, and D, D-. This grouping was arrived at by taking the standing of the student in the premedical sciences. In dividing the students into eight groups, however, we found that several groups contained too few students for statistical accuracy. Therefore, in most of the tables only four groups were considered, namely,

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CLASS OF	1915			1916			1917			1918			T
	T	F	XF	T	F	XF	T	F	XF	T	F	XF	
ALL STUDENTS	153	51	33.3	17	3	17.6	88	27	40.6	131	32	24.4	138
N.Y.U. HEIGHTS	3	1	33.3	7	1	14.3	72	22	30.5	112	21	18.7	118
N.Y.U. SQUARE													
COLLEGE OF THE CITY OF NEW YORK	14	4	28.5	3	-	0	3	-	0	4	-	0	5
COLUMBIA	4	1	25.	3	-	0	4	2	50.	3	2	66.7	3
FORDHAM				1	1	100.	2	-	0	2	2	100.	1
ALL OTHER COLLEGES	12	5	41.6	3	1	33.3	7	3	42.8	9	6	66.7	11
HIGH SCHOOL ONLY	120	40	33.3							1	1	100.	

A - Carefully selected by Committee on Adm

B - Selected if maintaining "C" average or

C - Selected if meeting minimum requiremen

CLASSES

18	1919			1920			1921			1922			1923			1924			1925			
F	AF	T	F	AF	T	F	AF	T	F	AF	T	F	AF	T	F	AF	T	F	AF			
32	24.4	138	41	29.7	128	28	21.9	142	41	29.	68	31	45.6	132	58	43.9	136	42	30.8	138	53	38.4
21	18.7	118	36	30.5	89	16	17.9	101	21	30.6	27	15	55.6	27	13	48.1	50	14	28.	52	15	28.8
																	1	-	0	1	1	100.
-	0	5	1	20.	8	-	0	7	1	14.3	14	5	34.3	48	14	29.2	33	6	18.2	28	10	35.7
2	66.7	3	-	0	4	3	75.	10	2	20.	15	7	46.7	20	8	40.	18	5	27.8	24	10	41.7
2	100.	1	-	0	2	1	50.	1	-	0				18	16	88.9	12	7	58.3	6	4	66.7
6	66.7	11	4	36.4	25	8	32.	13	7	53.8	12	4	33.3	19	7	36.8	22	10	45.5	27	13	48.1
1	100.																					

tee on Admissions
average or higher
requirement

C+ - Personality considered in addition
to meeting minimum requirement

Table 1.

CLASSES 1915-1926 INCLUSIVE--RESULTS OF EXAMINATION END OF FIRST YEAR AND METH

METHOD OF SELECTION

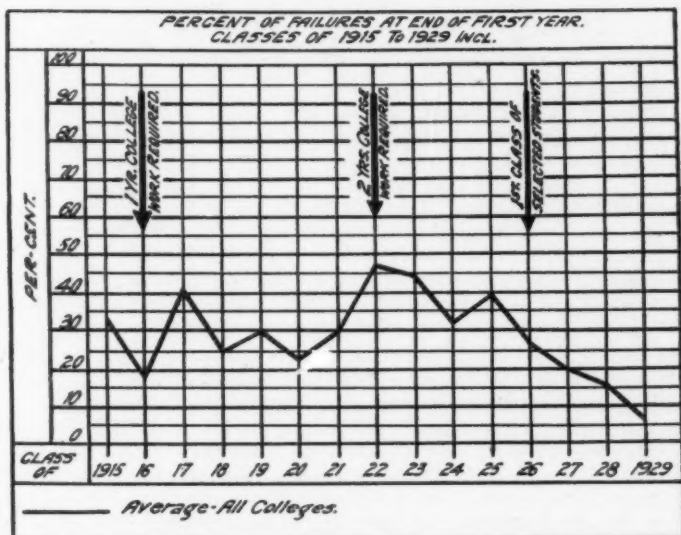
1925			1926			1927			1928			1929			1915-'24	1925	1926	1927	1928	1929
F	XF	T	F	XF	T	F	XF	T	F	XF	T	F	XF	T						
8	53	38.4	125	31	24.8	129	25	19.4	109	17	15.1	112	6	5.4						
2	15	28.8	59	16	27.	56	7	12.5	17	2	11.8	37	-	0	C	C	C	B	B	A
1	1	100.	3	1	33	2	1	50.	8	1	12.5	12	-	0	C	C+	C+	C+	A	A
8	10	35.7	23	4	16.6	21	1	4.7	44	3	6.8	29	-	0	C	C+	A	A	A	A
4	10	41.7	11	2	18.	10	2	20.	7	3	42.9	7	1	14.3	C	C+	C+	C+	C+	A
6	4	66.7	7	1	14.3	13	5	38.5	13	6	46.2	3	2	66.7	C	C+	A	B	B	A
7	13	48.1	22	17	31.8	27	9	33.3	20	2	10.	24	3	12.5	C	C+	C+	C+	A	A
															C					

AND METHOD OF SELECTION OF STUDENTS--SEE PAGE 4.

CLASS TO											
1913				1912				1911			
T	F	W	Th	T	F	W	Th	T	F	W	Th
1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31					
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A, B, C and D groups, consolidating the A and A-, B and B-, etc. It may seem strange that any D- student should ever have been accepted. During the entire four years of the experiment only two such students were accepted and that was in the first year; they were D students who had to pass off a deficiency in a required subject before admission in the Fall.

A still further grouping which we have been able to use was a grouping arranged according to the number of years of college work which the students had completed. We made three such groups; (1) students having completed work required for a baccalaureate degree, (2) students having completed three years of collegiate work and (3) students having completed two years of such work.



Graph 1.

Fortunately, during the period of this experiment the curriculum has remained practically the same and there have been no changes in the examiners, so that the method of marking has been uniform. Knowledge of the students' collegiate standing on the part of the faculty could never have influenced the marking of these students at the completion of the first year of medicine as our classes are so large that it is rarely that the heads of our departments know even from what college the students have come and they seldom know their academic record before entrance. I might say that I myself do not come in con-

tact with the students after admission until they reach the third year; in this study I have simply correlated their collegiate standing with the grades received at the end of their first year of medicine.

To anyone who has served on a committee of admissions, the fact that different institutions grade differently is well known, that is, that the A student of one institution is the equivalent of a B student of another institution. For this reason it was feared at the beginning of this work that consolidated curves from various colleges would show little of significance. As the work has progressed, glaring inconsistencies in collegiate marking in the sciences have seemed rare. That this does sometimes occur, however, is of course true.

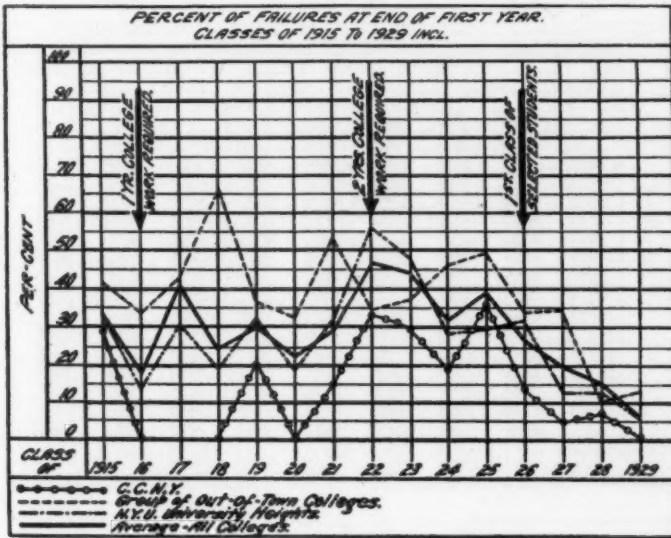
CLASSES 1915-1926 INCLUSIVE

RESULTS OF EXAMINATION END OF FIRST YEAR AND METHOD OF SELECTION OF STUDENTS

Graph 1, which is made up from the figures in Table I, shows the percentage of failures at the end of the first year of classes 1915 to 1929, inclusive. In 1911 (class of 1915), the minimum requirement for admission was high school graduation, including a year's work in biology, chemistry and physics. With the admission of the class of 1916, the requirement was raised to one year of college work and with the admission of the class of 1922 to two years of college work. With the admission of the class of 1924 in the year 1920, selective admission automatically began to operate, but not until the admission of the class of 1926 in the year 1922, was selection on a scholarship basis begun.

In our school, at least, whenever the entrance requirement was raised, great difficulty was experienced in immediately filling the class with the type of students desired. It will be noticed that there is a distinct rise in the percentage of failures in the class of 1917 the second year after the raise to the one year requirement, and again in the classes of 1922 and 1923 after the raise to the two year requirement. But why did the percentage of failures in the class of 1916, the first class to be admitted with the one year requirement, fall? This, I believe, is easily explained when the facts are known. There were only seventeen new students in this class. With such a small class, each student received much more individual instruction, and a special effort was made to maintain the numerical strength of this class. An additional factor in the large percentage of failures in the classes of 1922 and 1923 we believed at the time was due to the war; as those were the classes admitted in 1918 and 1919. With the exception of these four years, the percentage of failures runs between 23 and 32 per cent. The percentage of failures did not fall for the classes of 1924 and 1925 below this average, in spite of the fact that they were selected classes. This was during the time when the selection was a matter of hit or miss.

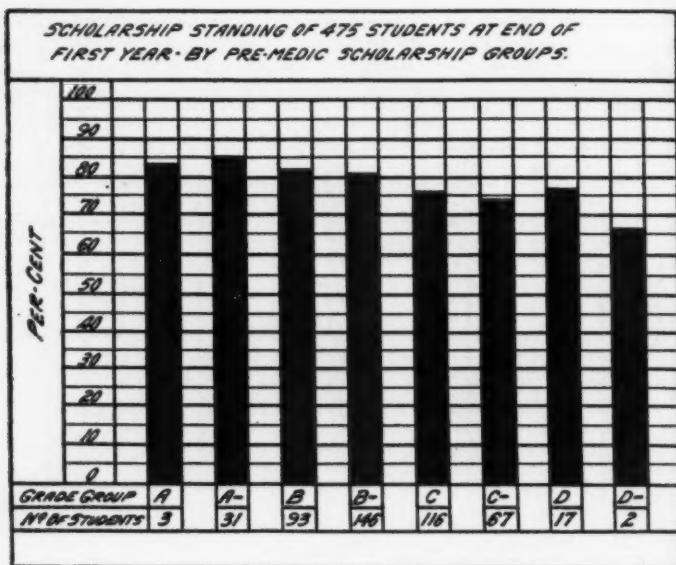
Beginning with the class of 1926 when selection on the basis of scholarship was begun, the percentage of failures falls abruptly until the class of 1929 when the greatest number of students were accepted on a purely scholarship basis and it fell to the surprisingly low percentage of 5.4.



Graph 2.

Graph 2, which is made up from the figures in Table 1, shows the same curve as that in Graph 1 and plotted with it the curve showing the percentage of failures of the students entering from the College of the City of New York, from New York University, and from a group of out of town colleges. These curves have little significance before the class of 1922 as the number of students coming from college was frequently too small to give accurate data. From the class of 1922 on, however, the percentages are interesting to study. The average of the City College group begins to fall first and remains consistently below the class percentage and below the New York University and out-of-town college groups percentages. It will be remembered that the City College group was selected on a purely scholarship basis beginning with the class of 1926 in the year 1922. The New York University group curve is seen to fall one year later or not until the students from New York Uni-

versity had begun to
representing the out
year later still which



Graph 3.

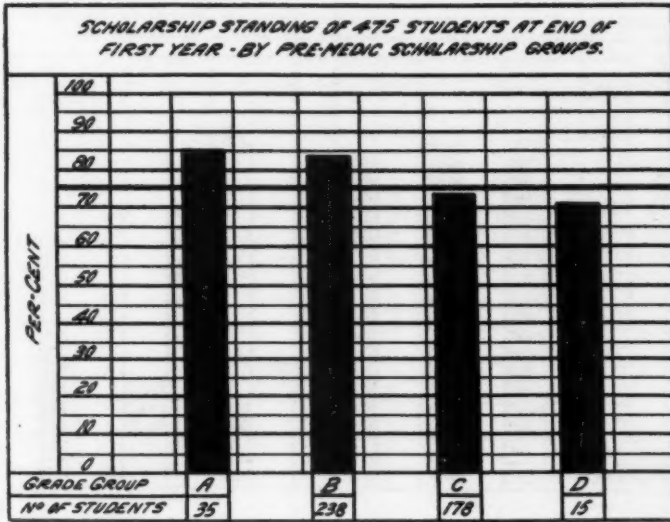
Graph 3, which is made up from the figures in Table 2, shows the scholarship standing of 475 students (of the classes of 1926 to 1929, inclusive) at the end of the first year of medicine by college scholarship

TABLE 2—SCHOLARSHIP STANDING OF 475 STUDENTS END OF FIRST YEAR
BY PREMEDICAL SCHOLARSHIP GROUPS

Grade Group-----	A	A-	B	B-	C	C-	D	D-
No. Students-----	3	31	93	146	116	67	17	2
Average in per cent---	83.1	85.5	82.	81.5	76.6	69.8	71.	67.4

Abstract

groups. With the exception of Group A, which contained only 3 students, and Group D, which contained only 17 students, it is a table of diminishing returns and shows that there is a distinct relationship be-



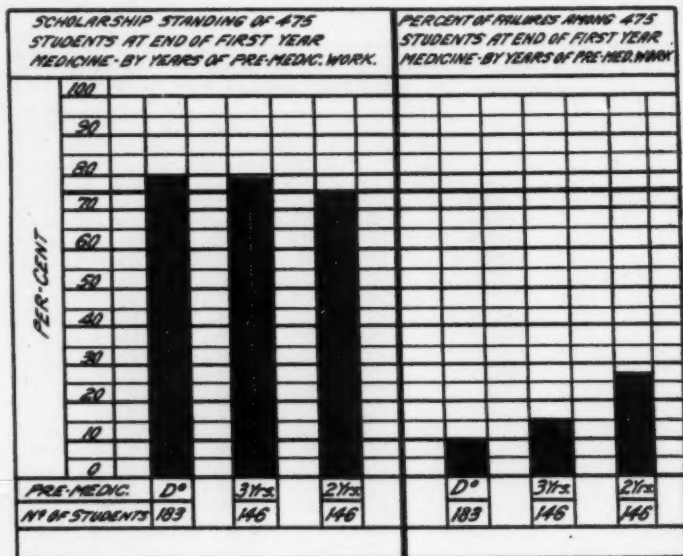
Graph 4.

tween collegiate standing and the general average of these students at the end of their first year. This is more strikingly shown by Graph 4, taken from Table 3 where the A and A- and B and B-, etc., groups are consolidated into four groups.

TABLE 3—SCHOLARSHIP STANDING OF 475 STUDENTS AT END OF FIRST YEAR BY PREMEDICAL SCHOLARSHIP GROUPS

Group	No.	M.
A	34	85
B	239	83.8
C	183	74.3
D	19	70.7
Total	475	78.8

Graph 5, made from Table 4, shows the relationship of class standing at the end of the first year of medicine to the number of college years of premedical work, and also the relationship between the college



Graph 5.

years of premedical work and percentage of failures at the end of the first year. Students with three years' preparation show only a slightly lower general average than those with a degree, but that students with only two years of college work show a definitely lower average. The

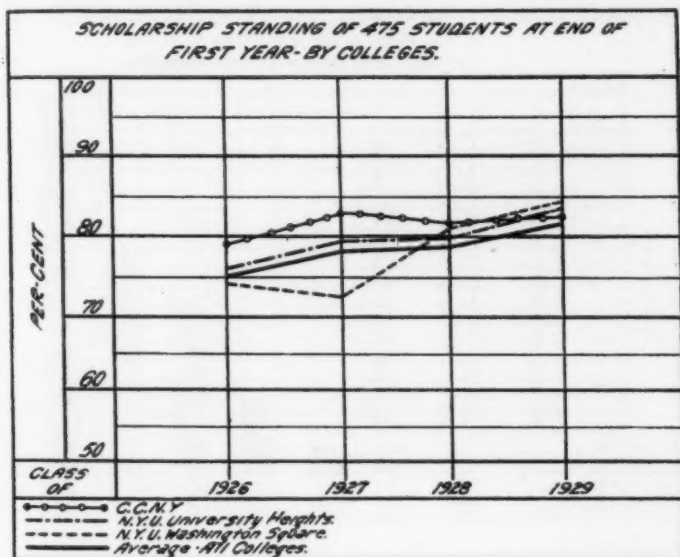
TABLE 4—SCHOLARSHIP STANDING OF 475 STUDENTS AT END OF FIRST YEAR BY YEARS OF PREMEDICAL WORK

	Degree	3 Years	2 Years
No. in Group.....	183	146	146
Average in Per Cent.....	80.1	79.6	75.8

percentage of failures among degree students is lower than among three-year students but not as much lower as the difference in the percentage of failures of the three-year students is below that of the two-year students.

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Graph 6, made from the figures in Table 5, shows the scholarship standing of three different collegiate groups and the average standing of students from the College of the City of New York, New York University (Heights), and New York University (Washington Square) for the classes 1926 to 1929, inclusive, which is the period of selection by



Graph 6.

scholarship. The general average for the whole class rises each year, rising from 75 per cent in the class of 1926 to 82 per cent in the class of 1929. The college curve of the College of the City of New York is consistently high throughout the four years, during which time selection was entirely on a scholarship basis. The curve of New York

TABLE 5—PER CENT OF FAILURES AMONG 475 STUDENTS AT END OF FIRST YEAR OF MEDICINE BY YEARS OF PREMEDICAL WORK

	Degree	3 Years	2 Years
Failures, Per Cent.....	9.8	15	26.7

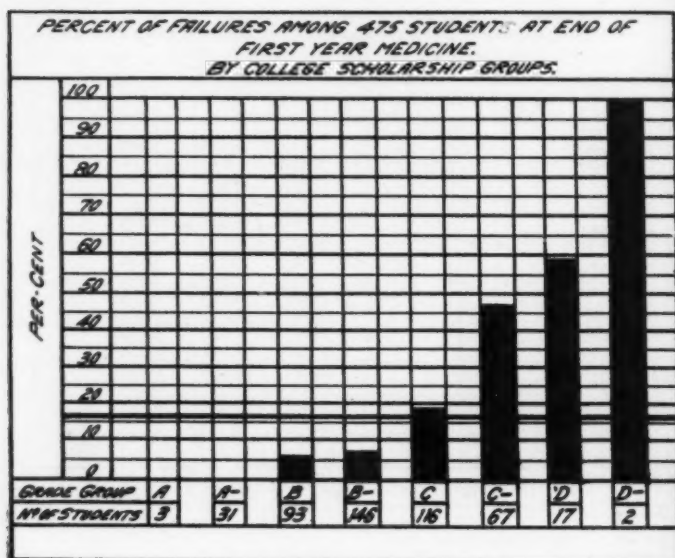
University (Heights) rises first in the class of 1927 when scholarship selection began first to be used for this college and rose still higher in the class of 1929 when it was used as the only criterion for selecting

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students from New York University (Heights). The New York University (Washington Square) curve does not rise until the class of 1928; this was coincident with the time that careful scholarship selection was made with students from that college.



Graph 7.

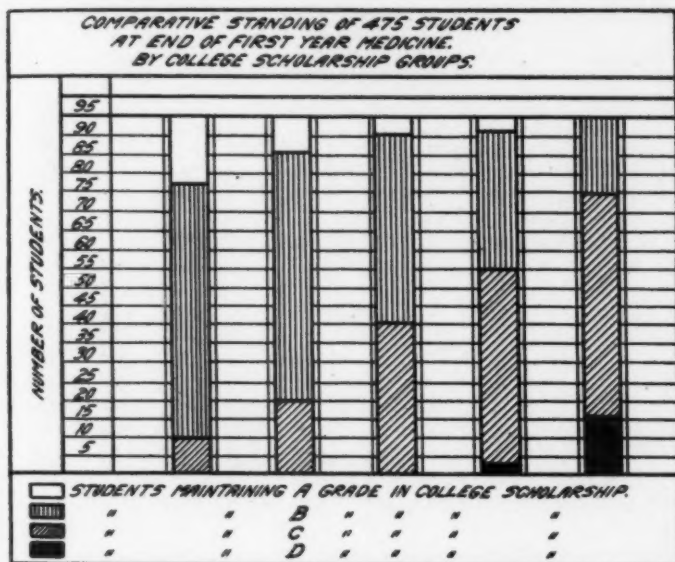
Graph 7, which is compiled from Table 6, shows the percentage of failures among 475 students at the end of the first year of medicine by college scholarship groups. It is seen that no students failed in the

TABLE 6—SCHOLARSHIP STANDING OF 475 STUDENTS AT END OF FIRST YEAR BY COLLEGES—CLASSES 1926-1929

College	1926	1927	1928	1929
N. Y. U. (Heights)-----	76.	79.5	79.6	83.5
N. Y. U. (Square)-----	74.1	72.4	81.3	84.1
C. C. N. Y.-----	79.	83.4	82.7	82.9
Total	75.9	78.7	79.	81.8

A or A- groups and that the percentage of failures increases with each succeeding group.

Graph 8, which is compiled from Table 7, shows the comparative standing of 475 students at the end of the first year of medicine by scholarship groups. The 475 students have been arranged in 5 groups of 95 each, according to their standing at the end of the first year of medicine. The standing of these men in college scholarship is shown



Graph 8.

graphically by various shadings as indicated in the legend. No A students got into the last group and that the majority of A students are in the first two groups. No D student got higher than the fourth

TABLE 7—PER CENT OF FAILURES AMONG 475 STUDENTS AT END OF FIRST YEAR MEDICINE BY COLLEGE SCHOLARSHIP GROUPS

Group	No.	Per Cent Failed
A	3	0
A-	31	0
B	93	5.4
B-	146	6.8
C	116	18.1
C-	67	46.2
D	17	58.2
D-	2	100
Total	475	

group and the standing of the B and C students in medical school is consistent with their standing in college.

TABLE 8—COMPARATIVE STANDING OF 475 STUDENTS AT END OF FIRST YEAR MEDICINE BY COLLEGE SCHOLARSHIP GROUPS

	Highest One-fifth	Second One-fifth	Third One-fifth	Fourth One-fifth	Fifth One-fifth
"A" Students-----	18	9	4	3	--
"B" Students-----	67	64	51	37	20
"C" Students-----	10	22	40	52	59
"D" Students-----	--	--	--	3	16

It is not our purpose to force any conclusions from this study. It can at once be argued that the criterion used for the measure of selection is not the one which we should use; that is, that we are not particularly interested in the ability of our students to make high marks—we are rather interested in the fact that the students selected shall be of the highest character. To this, I think we all agree. However, it is interesting to know that the measuring rod used in college is much the same as the measuring rod used in at least one medical school and it is also interesting to know how comparatively rarely really poor students in college arrive at mediocrity in medical school or mediocre students at college arrive at excellence in medical school on the basis of scholarship. Furthermore, it is interesting to see how the wastage at the end of the first year at medical school may be cut by giving heed to the collegiate standing of students.

In doing this work, many other interesting correlations have suggested themselves. Some of these have already been made but lack of time prevents their presentation at this time. Others, we hope to make in the future if the pressure of other work will allow us. Studies have been begun with the hope of throwing light on the relative value of the different sciences as preparation for medical school work, also exact studies of age and racial groups in relation to medical school scholarship.

In conclusion, I wish to thank Miss Cécile J. Nogué and Miss Laura S. Anderson of the New York University staff for the secretarial help, and Dr. Frances Barnhart of the class of 1925 for invaluable statistical assistance.

DISCUSSION

DR. E. STANLEY RYERSON, University of Toronto, Toronto: I would like to relate the experience we had at the University of Toronto in an endeavor to select students, or rather in an endeavor to find out a way of selecting some students.

A study was made of two classes of students from the time they took their high school entrance examination up to graduation. In the province of Ontario, practically all students take one examination. The standard is the same for the whole group. Taking the record for that examination and fol-

lowing the record of these men through the university course, it was found by the mathematical calculation that the psychologists use nowadays that there was practically no relationship between the standing which the men took at the matriculation and the standing which they took in their medical course. To put it in another way, a man who took a high standing at matriculation, would not necessarily take a satisfactory course of medicine and take a high standing. And that would work vice versa too. A man might take a comparatively low standing at matriculation and do very well in the medical course.

Another calculation was made of the standing which the students took in the first year which practically corresponds to your premedical work. In the relationship of the standing of the men in this part of the course to their future course, it was found that there was a very much closer relationship between their standing in the premedical work than there was in their matriculation work. The closest relationship of the whole group was between the standing which the man took in the subject of biology and his future medical course. The standing in biology was the best indication as to whether a student would do satisfactory work in his medical course.

Another study was made with the idea of ascertaining how well the progress of the students, who did not succeed in their first year of medical courses, was made. A period of ten years was taken and 500 students, or rather to be specific, 440 students who had had a failure in one or more subjects in their first year, were considered. It was found, in following the record of these men through their course, that only 50 per cent subsequently graduated. Of the 50 per cent who graduated only 10 per cent succeeded in passing without further failures and further conditions in their course. That indicated that the selection in the early part of the course was well worth while.

As a result of that study we have introduced a system of endeavoring to put the screws on tighter at the beginning of the course, so that if a man does poorly in his first year he should be eliminated at that period rather than let him proceed to the more advanced parts of the course.

It is particularly interesting to see this worked out in such a thorough way by Dr. Wycoff, showing that the experience in other colleges has been much the same as it has been in the University of Toronto. I think if a study were made of a good many colleges it would be a good thing. The number of students applying is making this a serious problem and if we can arrive at some conclusion or get some light on a method of selection, it will certainly be of value.

We haven't as yet introduced the personality study at Toronto, but it may be that we will have to come to that and it looks as though that will be the best addition to our study of scholarship.

DR. WILLIAM DARRACH, Columbia University, New York City: We have had about the same experience at Columbia. I think, however, that we want to be pretty careful to preserve that small group who do not do well at college but who do well at medical school. Any system which artificially cuts out the possibility of holding those unusual men is unfortunate. If you go on scholarship alone, you are going to lose most of those men, but if some other test can be applied, you will conserve those men.

For several years a group at Columbia has been devoting a good deal of time and attention to trying to evaluate the premedical student on the basis of what they think he is going to do as a doctor. Of course, scholarship counts a good deal, but they also take into account other things which enter into the make-up of a good doctor. Each year they spend considerable time trying to rate and grade students at Columbia, men who are going into medicine, on a general scheme, taking into account the progress they have made and the personal side of the man, his ability to get on with other men in his class and various other things.

They grade these men into groups of A, B and C, with plus and minus.

The A men are almost without question sure to go through without condition. That is a small group, however, and out of one hundred, perhaps fifteen or twenty would be in that group. They will not recommend the C group to us. They say that we may accept them, but we do so on our own responsibility. The B group is the group they recommend, but with some reservations.

Occasionally we have admitted men from the C group as a result of our own investigation of the men and the talks we have had with them. We talk with almost every single applicant and try to size him up. The C men we have admitted on our own are very apt to show that our judgment is not as good as the judgment of the group at Columbia.

That rating of the Columbia group is open to all the other colleges, and I think that the New York schools have taken advantage of it in the last year or so. I am wondering what they have found to be the result of that Columbia grading. That allows you to get the man that I spoke of first, as the unusual type, who has not done well in college. He has been interested there in other things besides the studies, and once he gets into the medical school, he constantly improves and he may be a useful man, not only in the school but after he graduates. There are two or three outstanding examples of such men who have done exceptionally well as internes and are now doing excellent work outside. If we had stuck strictly to a scholarship basis they would not have been admitted to the medical school.

I am wondering if Dr. Wycoff, in his failures during the first year, has included that small group of men who drop out within the first two or three weeks, or the first month because they are in the wrong pew.

DR. CHARLES P. EMERSON, Indiana University Medical School, Indianapolis: Our children in schools differ not nearly so much in ability as they do in mental pattern. The American school is standardized for mass production along standardized lines, and just as the line on type, the A line, drops down from the bar to the A slope, the B into the other, so those are dropped into the A. B. C classes and they are much more likely to be boys who conform to a standard pattern which our school has agreed is satisfactory for purposes of mass production.

In that connection I would like to ask if it is not true that in Ontario a much more select group of boys takes the course in college. They do not get C-. Therefore, in the subdivisions which he would make, he is really in the A and B groups we have in the states where there is an attempt at more universal and more democratic form.

It is said that Professor Helmholtz was the most stupid man whom his students could ever talk to. He was a perfect blockhead and yet, he had a peculiar pattern that made him one of the greatest scientists of the nineteenth century. I would like to hear a paper read which would study the history of the men who had become geniuses, evident successes in the American medical line.

It is said that one of our most honored men, who recently died, was sought by his medical faculty not to study medicine. At any rate, the pattern that suits the academic man may not suit the medical pedagogue at all.

DR. L. S. SCHMITT, University of California Medical School, San Francisco: We have had an experience similar to that of Dr. Emerson. For the last five years, we have admitted to the medical school a selected group of students, that is to say—on account of the competition for admission into the medical school, an applicant must have had at least a "B" average during his pre-medical course. Less than 50 per cent of the applicants have been admitted.

Recently, a study has been made of the scholastic standing of students after admission to the medical school in comparison with their standing on admission. The students have been ranked in their class when admitted and again at the end of each medical school year. It has been found that those

who are admitted in the upper third of the class largely stayed there during their medical course, but it is not unusual to find some in the lower third on admission advanced to the upper third after admission. There is also a variation between the middle and lower third, and some in the lower third have advanced to the upper third. There has also been found some variation in the rank attained during the years of the fundamental sciences and during the clinical years.

We must always remember that we are only considering students who have attained a "B" average on admission so that our study bears out Dr. Emerson's statement that there are some students who do not conform to the types set for admission, but who afterwards find themselves and advance rapidly in their scholastic ratings.

DR. E. P. LYON, University of Minnesota Medical School, Minneapolis: I should like to ask the men present what they think is the relation of scholarship to character? What we call character, of course, as the speaker said, is the essential things that we are after.

I will give my impression, which is this: Of course, we reject a man when we have a record of delinquency that would make him an immoral person. But those cases are very rare. Usually we do not know, and I do not know of any way of knowing. One thing we get are cases of cheating. Of course, that is an indication of a man who has a dishonest streak in him. As far as I can remember there has never been a case of that among any men in the higher graded classes. I can remember in my thirteen years at Minneapolis, perhaps three men who have actually been a disgrace to the school and the profession they have gone into. Every one of them is a man of low scholarship.

I believe that our scholarship record has a very distinct correlation into character and that it is the best thing we can adopt in selecting the students. To follow Dr. Emerson's suggestion, you have almost got to take a hundred men and pick out a few possible ones that have possibilities in them to make good. I found from my experience exactly what the speaker indicated.

DR. W. H. MACCRACKEN, Detroit College of Medicine and Surgery, Detroit: I think you will all agree that on the average men who have had four years will do better work than men who have had three years of academic training and men who have had three years of academic training will do better than those who have completed only two years.

The reason of this seems quite obvious to me. The men who took the three or four years of academic training were voluntary students. They took these extended courses for what they could get out of them, because they wanted something. Students who complete only the two years of prescribed premedical training are the acceptable minimum students and they are apt to be the acceptable minimum students throughout their work in medical school. On an average we can depend on this.

I am much interested in this question, for in a year or so, we in Detroit, will establish a three or four year entrance requirement and I am curious as to whether or not students obliged to meet this advanced requirement in order to be registered, will be of as high a type as those who have voluntarily elected the same amount of academic training. I have my doubts.

I think what Dr. Lyon says is absolutely true. In looking back over several students whom we have graduated and of whom we are heartily ashamed, whose conduct has been a disgrace to themselves, to the community, and the school from which they were graduated, we find that as students they were without exception barely able to make the grade.

DR. JOHN WYCKOFF: I do not think that I have ever had to close a discussion where I could more truthfully say that I have agreed with all that has been said. As stated before, this paper dealt only with scholarship. There

are three distinct things to be considered in the choice of a student; his physical ability, his mental ability and his character. Because this paper does not touch on the question of physical ability or character, does not mean that we do not consider it essential. In reply to Dean VanBeuren's question as to what a "C" student was, I would say that a "C" student was one whose general average in his premedical sciences was "C." "C" grade is the grade of the average student, "C-" is one below the average and "D" considerably below the average.

Unquestionably there are students who did poor work in college, who entered the medical school and there did good average work and afterward became fine physicians. They should be saved. However, I think it is extremely rare that such students are in the very low group of scholastic standing. They are more usually average students. In the last four years we have not had a student with a very low standing in college do better than low average work in medical school. The statistics reported here were not collected primarily for presentation before this body but are to be presented to our own faculty with the idea of showing them the uselessness of admitting students of poor scholastic standing with the hope that they will do better in medical school.

DETERMINING THE FITNESS OF THE PREMEDICAL STUDENT*

FRANKLIN D. BARKER

Northwestern University

It has been my privilege, during the past twenty-five years, to come into close personal touch with, and to advise more than three thousand premedical students. Out of this experience there have grown certain definite convictions and ideas regarding premedical education and ways of determining the fitness of the premedical student.

In determining the fitness of the premedical student we should have in mind, as clearly and as definitely as possible, the qualities that are essential to the successful pursuit of the study and practise of medicine.

The important question also arises as to whether these qualities are innate or may be acquired. Is the real doctor born or created? If these essential qualities are inborn, how may they be discovered and developed? If they can be acquired, how may they be evolved and fortified?

My personal conviction is that the real doctor is born and not made and that he is truly called to his life's work. If this is the case, we who are chiefly concerned with premedical education should devote our best thought and effort to devising a program which will enable us to discover these embryo doctors and develop these inborn qualities.

The letter of inquiry concerning applicants which the Harvard

*Read at the Thirty-Seventh Annual Meeting held in Cleveland, Oct. 25 and 26, 1926.

Medical School sends out seems to me to state in an ideal way the necessary, essential qualifications of one fitted to successfully pursue the high calling of the study and practice of medicine. These qualifications are a strong personality, the possession of high ideals, capacity for leadership, sense of opportunity, honesty, and scholarship above the average.

In our large colleges and universities in which the majority of pre-medical students receive their training, the classes are so large that it is impossible or very difficult for instructors to ascertain whether or not the individual student possesses these qualities. Many instructors do not know the students in their classes. They know only the outstanding students, the exceptionally good or exceptionally poor ones.

The majority of instructors have little or no knowledge of medical education; they take no particular interest in the premedical student, his special needs and natural interests. Such an instructor fails to place emphasis on the most important parts of his subject and in his teaching does not take advantage of the natural interests of the pre-medical student. Too many instructors fail to recognize that any course may be a happy combination of discipline and practicality.

The present situation may be improved greatly by having the medical course begin, in intent or in fact, with the first year of the pre-medical course: in fact, by following the Toronto plan, the college of medicine incorporating into its curriculum the premedical courses and administering them in the college of liberal arts; in intent by a closer and more sympathetic cooperation between the college of medicine and the college of liberal arts.

Many colleges of liberal arts strongly resent the rapid development and growth of the professional schools and colleges with the inevitable defection and loss of students. The college of liberal arts today has a far greater opportunity than heretofore of justifying its existence and increasing its usefulness by recognizing the present tendency in education and by adopting a more liberal policy of cooperation in its relation to the professional schools.

I am convinced that the faculty of a college of medicine is better qualified, through its knowledge of medical education and the qualifications necessary for the successful study of medicine and through the personal experience of its members, to formulate the premedical course than is the average liberal arts faculty with an entirely different viewpoint, ideals and training.

With such a plan as indicated, the college of medicine could formulate the premedical course. It could also control or definitely influence the content and the teaching of premedical subjects. Such a plan would make possible the segregation of premedical students, which would make it possible to give a different slant to courses, to set higher academic standards, and to secure better teaching through better qualified teachers.

During the past ten years at the University of Nebraska, we have been working out a plan for better determining the fitness of the pre-medical student. A similar plan has been inaugurated this year by Dean Cutter at Northwestern University. The Nebraska plan is briefly as follows:

A well qualified member of the liberal arts faculty is appointed as an adviser or councilor for all premedical students. The adviser is responsible for the proper registration of all premedical students, thus avoiding many serious errors which always occur when registration is delegated to several uninterested and often uninformed advisers.

The premedical adviser is in close personal contact with each pre-medical student throughout his course thereby gaining an intimate knowledge of each individual, his strong points and his weak points. By advice and counsel he is able to aid the student in developing the best that he possesses. Through his personal acquaintance, he can more accurately and justly pick out the "fit from the unfit" and segregate the "sheep from the goats," thereby often preventing the spoiling of a perfectly good blacksmith who might otherwise try to practice surgery. Incidentally, he is able to "lower the death rate" by the friendly advice of "go plow" instead of "practice." The premedical adviser becomes a director of personnel in the best sense, he helps the premedic to find himself.

The Nebraska plan involves a definite organization of all pre-medical students in a club or society with simple constitution and student officers. This brings together in regular meetings a group of students having common interests, striving for the same goal. These meetings engender a fine esprit de corps, helpful rivalry and emulation.

Carefully selected medical men are secured as speakers and are able to give helpful advice and encouragement from their own experience and to unfold and make possible the visualization of the great field of medicine. These outstanding men become ideals for emulation by the premedical student and he gains a broader understanding and a better appreciation of the opportunities and a fuller realization of the responsibilities of the medical profession. Such meetings and contacts create a stimulating and helpful professional atmosphere which pervades the premedical courses.

The regular meetings are supplemented by visits to clinics, medical meetings, and reunions of former premedical students, all of which give a zest and incentive to better work.

The tangible results of this plan have been, first, an increase from 25 per cent to 70 per cent in the number of our own premedical students pursuing the medical course in our own college of medicine; second, a more reliable selection of the best fitted students based on more definite data and a personal acquaintance. In determining the fitness of the premedical student, we have applied the "Harvard yard-

stick" and have also given weight to the student's attitude toward his work and the progress made. In evaluating his scholarship, we have found that his record in the biological sciences was the most reliable index of his fitness for the study of medicine and his standing in chemistry the second best indicator. A third important result of the plan has been the sending of a better class of students to our medical schools.

In conclusion, the pertinent question arises as to whether this special attention given to the premedical student is necessary and worth while. The appreciation of premedical students, the hearty commendation of medical students, and practitioners, and our own experience, with the results obtained, confirm our opinion that it is worth while and is necessary to better determine the fitness of the premedical student, the doctor of the future.

DISCUSSION

DR. FREDERICK C. WAITE, Western Reserve University, Cleveland: There is in contemplation in Western Reserve University a plan which will solve some of the difficulties in regard to premedical, and what is going to become just as large a question, pre-dental education, since the dental school has an entrance requirement of two years of collegiate work and the same problem comes in there. President Vinson believes that the undergraduate work of the first two years should be separate from that of the last two. He proposes to organize in this city, on a separate campus, a series of junior colleges that will be under the administration of the university. If that plan is consummated, one of those junior colleges will be for the training of premedical and pre-dental students, not alone for our own professional schools but for any professional school.

Such a junior college will be administered in consultation with the men in the professional schools here and elsewhere, and it is hoped to build a curriculum which may closely correlate the work in the junior college with the needs of the students in the professional schools for which they are preparing. It is not definitely settled as to when this will go into effect, but I think it is likely to come here within the next ten years.

DR. J. J. R. MACLEOD, University of Toronto, Toronto: Referring to a remark that was made regarding the University of Toronto, I would like to say that I have had experience with both systems of using the six years allotted to the complete medical course, and I have not the slightest hesitation in saying that the point made by the speaker is one which I would thoroughly and heartily endorse. I believe it is a decided advantage to have the medical student realize from the very beginning of his course, that he is a medical student, and that the subjects which he is being taught in the academic college are an essential and intimate part of his medical training. That is an extremely difficult thing to do unless the members of the Arts faculty who are teaching physics, biology and chemistry are closely associated with the teachers, not only of the fundamental medical sciences, but of the clinical subjects as well.

It may be of interest to you to know that our faculty meetings at Toronto are attended regularly by the responsible teachers of medical students in each of the premedical sciences. One of these teachers is from the chemistry department. He is chairman of the committee of applications and memorials, so

that he has to become familiar with the problems of the earlier years of the medical curriculum. The representative of physics, similarly is a member of several committees and appreciates the medical problem.

My opinion is that we get more out of the six years course in Toronto by this system than is possible by any system in which the students for the first two years are grouped with Arts students and have to learn the principles of the subjects from all points of view, and not primarily as a basis for medicine. This is done in Toronto without any sacrifice of the principle that each of the premedical sciences must in the first instance be studied for its own sake. I am thoroughly satisfied that anyone who has experienced both systems will see that the combined course effects a great saving of time and that the students become much more enthusiastic during the first two years in the pursuit of their academic studies.

DR. IRVING S. CUTTER, Northwestern University Medical School: Dr. Barker's paper has in it a very definite element of value if we can get it across to the college of arts. The "art for art's sake" is a difficult thing to combat. The important thing that Dr. Barker has been able to do in Nebraska, and which is a tremendous asset to the beginning student in medicine, is this personal contact and personal advice. When we consider that he has come into personal, intimate contact, so that he actually knows the individual and knows him for over a period of two or three or four years, and when we consider that about 3,000 students pass through his own hands and under his personal supervision, we have some idea of the importance of the job. I am not sure but that if we could get to arts colleges the importance of appointing premedical advisors who would keep in touch with this Association and with colleges of medicine to which their students naturally go, we would have accomplished a great deal.

DR. HUGH CABOT, University of Michigan Medical School, Ann Arbor: There is a difficulty that there are a large group, the majority of colleges, which are sending students to medical schools, that have no medical school association or affiliation and have no easy way of effecting such affiliation.

For instance, at Michigan, only 40 per cent of students come to us through the University of Michigan; the rest come from all over creation, so to speak. I believe that the loose-ended premedical course has been very inefficient. The important thing for us to try to do is to point out to the Arts faculty that if they expect us to receive their students on a par with those with whom we have had a close contact, they must effect some relation or some affiliation with medicine so that the average premedical student shall be at least dimly aware that he is, perhaps in the future, about to be related in some remote way to the practice of medicine.

At the present time there is a strong tendency on the part of Arts colleges to believe that any suggestion of medicine in the premedical course is not only inadvisable but positively wicked. They think they ought to be taught pure science, and if there is any suggestion that they are headed for medicine it is all bad. I am not quite sure that it is.

DR. FRANKLIN D. BARKER: I believe there is a little encouragement and that is that we may, when the present generation of members of the colleges of liberal arts pass on, hope to accomplish something (laughter) because it must be that drop by drop the stone will wear away, and in this case it is a matter of education. I believe fully that we are not taking advantage of the opportunities which we have as members of liberal arts colleges, and that medical men can do very much toward solving this problem by making it a point to become better acquainted with these members of the liberal arts colleges and educate them along these lines.

WOMEN GRADUATES IN MEDICINE*

MARTHA TRACY

Woman's Medical College of Pennsylvania

The facts reported in this report have been secured from questionnaires returned by 471 women physicians in response to a total of 1833 questionnaires sent out in May, 1926.

It was decided to make an effort to study the activities of women who had graduated in medicine in the years 1905 to 1910, and in the years 1912 to 1921. Thus might be secured some picture of the change in professional requirements taking place between these dates, and the effect on women physicians of the trend toward medical specialism.

At the outset I wish to express my appreciation of the help given me in securing the names and addresses of these graduates, by Dr. N. P. Colwell, of the Council on Medical Education of the American Medical Association, and by the deans of all medical schools which, during these periods, granted medical degrees to women.

Chart I. Basis of Study.

Study of women graduates in medicine
in two period groups, 1905-1910, and
1912-1921, based on facts reported in
471 questionnaires returned.

Total number of questionnaires sent
out to all women graduated in
medicine during periods selected - 1833
Number of questionnaires returned 535

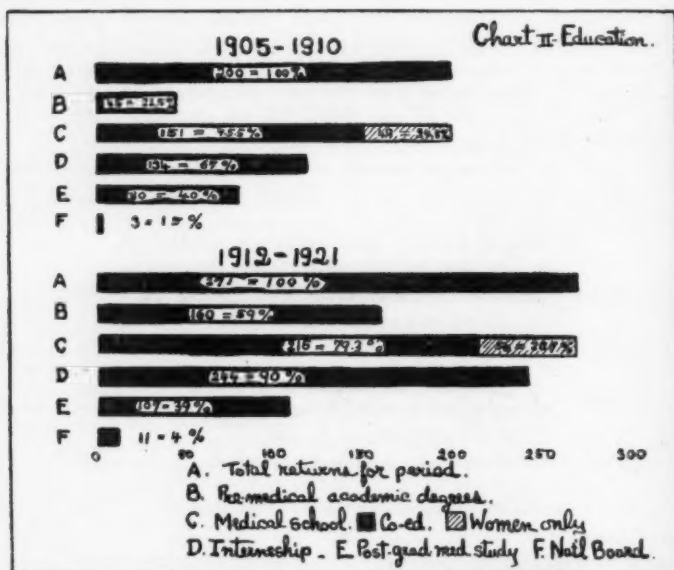


A total of 1833 names became thus available. There were approximately 100 women on the lists received, whose addresses were unknown. The questionnaires were sent by first class mail with an explanatory letter enclosed, and very few were returned undelivered, so it is probably fair to conclude that the addresses are generally correct. A few notes brought the information that the doctor addressed

*Read at the Thirty-Seventh Annual Meeting held in Cleveland, Oct. 25 and 26, 1926.

was a man. The number returned was 535, of which 64 were from women graduated in years outside of the time periods to be studied, thus leaving 471 as the basis for the analyses to be presented.

There were 831 questionnaires to women graduating in 1905 to 1910, inclusive, and 200 replied, or 20.4 per cent. There were 834 questionnaires sent to those graduating in 1912 to 1921 inclusive, and 271 replied, or 32.4 per cent. The total replies, 535 out of 1833, constituted 29.1 per cent. This is, I believe, about the average response to be expected from such questionnaires, and the accuracy of any deductions are always subject to challenge because of the incompleteness of the figures.



The first facts of which classification was undertaken related to educational qualifications. Chart 2 summarizes these facts.

It will be noted that in the 1905-1910 group, 45 or 22.5 per cent of the women replying held academic degrees, bachelor of arts or of science, before entering the medical school; while in the 1912 to 1921 group, 160, or 59 per cent, held such premedical degrees.

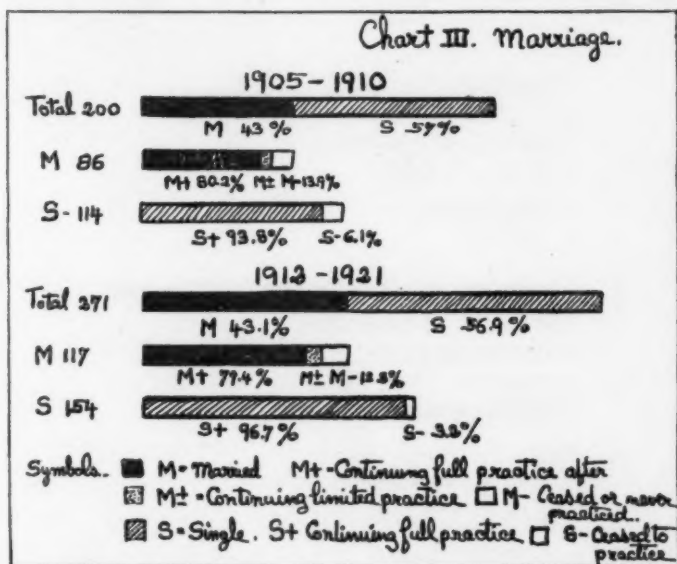
Of the 1905-1910 group of 200, 151, or 75.5 per cent, studied medicine in coeducational schools, and 49, or 24.5 per cent, studied in medical schools for women only. These included the Women's Medical

studied in coeducational medical schools, and 20.7 per cent in a school for women only, this being the Woman's Medical College of Pennsylvania, as the other two schools for women had been closed.

In the 1905-1910 group, 134, or 67 per cent, and in the 1912-1921 group, 244, or 90 per cent, served hospital internships.

Of the 1905-1910 group, 80, or 40 per cent, have taken postgraduate medical study, while in the 1912-1921 group the number is 107, or 39.4 per cent. In this younger group, however, many reply to this question "not yet," indicating a worthy intention.

The National Board certificate has been granted to 3, or 1.5 per cent, in the early group; and to 11, or 4 per cent, in the later group.



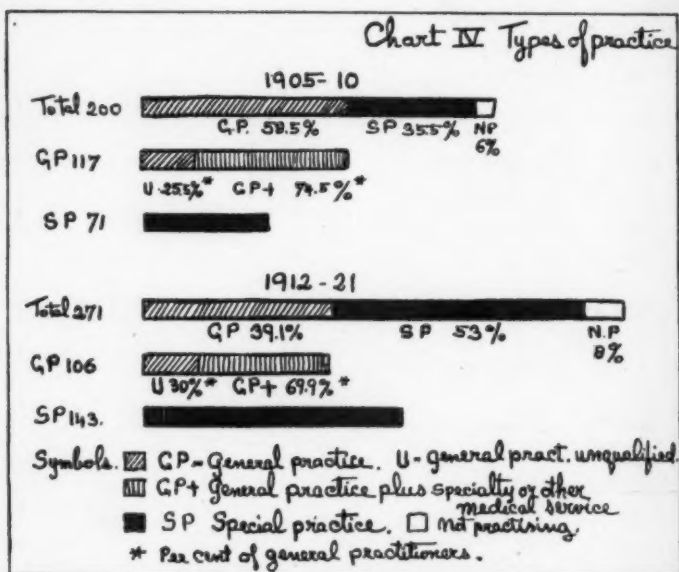
The better academic and professional preparation of the physicians graduating in the more recent period, as compared with those graduating twenty years ago, is, of course, reflected here.

The second subject studied was that of marriage, and its effect on the professional activities of the woman physician. The facts are summarized in Chart 3.

In the earlier period 86 women, or 43 per cent of the total replying in this group, are married, and 80.2 per cent of those who married continued full practice, the majority being in active practice today. A few continued to practice for from five to ten years or more but have now

retired. A small number, 5.8 per cent, continued a limited practice after marriage; and 13.9 per cent ceased to practice at once or within five years after marriage.

The women remaining unmarried, in the 1905-1910 group, number 114, or 57 per cent of the total for the period. Of these, 93.8 per cent are continuing in practice today, and 6.1 per cent have ceased to practice. In the 1912-1921 group, 154, or 56.9 per cent, remained single, of whom 96.7 per cent are practising today; 1.9 per cent retired from practice after 5 years or more, and 1.3 per cent practised or ceased within five years of graduation.



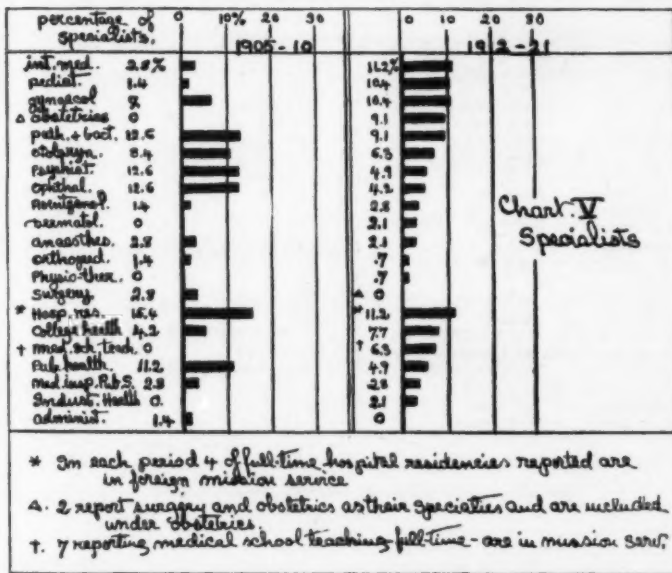
The number of women continuing full professional activity after marriage is, I believe, larger than the usual assumption of the casual and uninformed observer.

In Chart 4 are summarized the facts regarding the type of practice engaging the attention of women physicians.

The analysis first shows that of the women in the 1905-1910 group 117, or 58.5 per cent, are engaged in general practice, 35.5 per cent in special practice, and 6 per cent not practising; in the 1912-1921 group, 39.1 per cent are in general practice, 53 per cent in the specialties, and 8 per cent not practising.

In making this classification it seems justifiable to include, as general practitioners, those who checked all three branches, "pediatrics," "gynecology" and "obstetrics," even though the heading "general practice" was not checked. These fields of work constitute in the main the "general practice" of the woman physician. When, however, only one of these branches was checked, the individual was classified as a specialist in the field indicated.

It was, further, found of interest to subclassify the general College of Baltimore, the Woman's Medical College of the New York Infirmary for Women and Children and the Woman's Medical College of Pennsylvania. Of the 1912-1921 group of 271, 215, or 79.3 per cent, practitioners into one group, 25.5 per cent in the period 1905-1910, and 30 per cent in the period 1912-1921, whose total professional activity is

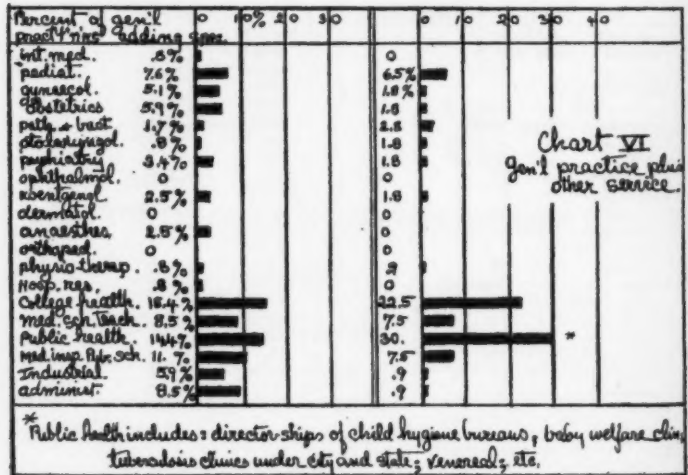


that of general practice, and a second group, 74.5 per cent in the 1905-1910 period, 69.9 per cent in the 1912-1921 period, who add to the general practice claimed, specialization in some branch, or who give a definite portion of their professional time to what may be called social medicine or public health.

In the 1905-1910 group, as Chart 4 showed, the number of women limiting their practice to a specialty was 35.5 per cent of the total. Chart 5 shows the specialties in which they are engaged. Services in

social medicine or public health are also indicated here, and are of a good deal of interest. In the 1912-1921 group, specialism has increased, but more in the direction of personal medical service, internal medicine, pediatrics, gynecology and obstetrics, and less in laboratory branches, this again being contrary to the assumption of many casual observers.

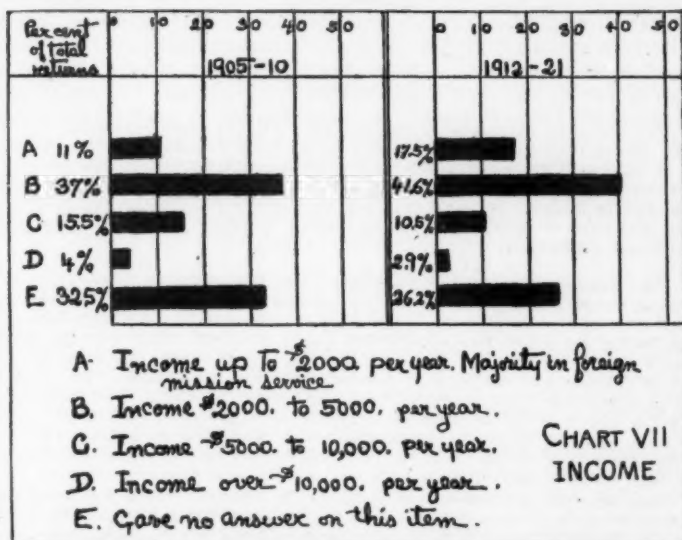
Of particular significance, it seems to me, is the interest of the woman practitioners in those special medical services which tend toward prevention of disease, not as expressed in laboratory research or sanitary engineering, but as expressed in human contacts, the personal health services in public clinics, by which I mean municipal or state clinics, for child welfare, for the tuberculous, and for venereal cases; and in the school and college health services, with and without teaching. This comes out more clearly in Chart 6.



The increase in specialism in personal medical service has decreased the number of women adding such specialism to their general practice. The social medical service, however, has increased, and is undoubtedly of growing importance. The call, for example, for women to organize and take charge of thoroughly adequate health maintenance services in schools and colleges, with the growing urge toward the development of courses in individual and public hygiene for all academic students, is a very real and increasing one. This sort of school service is distinct from the medical inspection of public school pupils which is recognized to be a much more limited service, though of growing constructive quality.

Similarly, the time given to public health service of various sorts, the directorships of bureaus or divisions of child health, municipal and state; and the service in state and city clinics and courts, grows in importance.

One other item it seemed of interest to classify, that of the professional incomes of women physicians. The incomplete facts are set down in Chart 7.



In the 1905-1910 group, 32.5 per cent, and in the 1912-1921 group, 26.2 per cent, gave no answer on this item. The replies received show that 11 per cent in the 1905-1910 period, and 17.5 per cent in 1912-1921 period, are earning less than or up to \$2,000. These groups include, as a considerable proportion, women in foreign mission service.

The largest groups in both periods are those earning between \$2,000 and \$5,000 annually, 37 per cent in the earlier, and 41.6 per cent in the later period respectively.

In 1905-1910 group, 15.5 per cent, and in the 1912-1921 group, 10.5 per cent are earning from \$5,000 to \$10,000, and 4 per cent in the earlier and 2.9 per cent in the later group are earning over \$10,000.

In reply to the request for an opinion as to the opportunities for the success of women in the medical profession, there is, in the great majority of instances, unanimity of opinion that for the woman with good training, good personality and willingness to work and to co-

operate with her professional brethren, there is unlimited opportunity for success, though a number reply that a woman must be about 50 per cent superior in the quality of her work to receive the same consideration as a medical man.

The study has been interesting, and, I hope, somewhat illuminating, though one must admit that the facts regarding the 1928 women who did not return the questionnaires might change entirely the percentage figures, as well as deductions tentatively drawn from the statistics available.

DISCUSSION

DR. WILBURT C. DAVISON, Baltimore: We are most fortunate in having these figures. In the medical schools which have women students we have to try to answer the questions which Dr. Tracy has so well analyzed. I hope when Dr. Tracy has these data published she will allow medical schools which have women students to order an adequate number of reprints for distribution. They will save us many hours in answering questions as to what becomes of the women graduates.

DR. MARTHA TRACY, Philadelphia: Dr. Weiskotten's paper was of interest to me because he has been pursuing the same sort of information under a similar sort of handicap as I—the lack of response to questionnaires. I am sorry to say the proportion of answers to my questionnaires was less than he secured from his group. That, of course, lessens the value of the total statistical study and makes even less accurate any deductions from the results of the questionnaires. Nevertheless, the facts, I think, are somewhat interesting and it would interest me particularly to have my figures put on some sort of a base line with Dr. Weiskotten's and see if any legitimate comparison can be made of the sort of thing that women do with the sort of thing that men do after they graduate.

This report is a presentation of the facts secured from 471 questionnaires returned from 1,833 sent out, which is far less creditable proportionate return than Dr. Weiskotten's. It may have been because my curiosity was greater and I asked too many questions, or it may have been that women, in general, do not take as much trouble to enter into group enterprise, as I think men are willing to do. However, those are the facts.

PRESENT TENDENCIES IN MEDICAL PRACTICE*

H. G. WEISKOTTEN

Syracuse University College of Medicine

The object of this paper is to present the results of a study made by the author in an endeavor to assemble some data as to the trend of medical practice. The study was made at the suggestion of Dr. Fred C. Zapffe, secretary of the Association of American Medical Colleges.

An effort was made to learn the type of practice being carried on by all of the graduates of all of the Class A medical colleges in the United States for the years 1915 and 1920. In so far as possible the names and addresses of the graduates of these two years were secured from each college, and letters and questionnaires were sent to them together with stamped, addressed envelope in which to return the filled-in questionnaire.

The questionnaire was made as clear, direct and brief as was deemed consistent with the information desired.

	College.....
	Year of Graduation.....
1. Name.....	2. Present Age.....
3. Address	
4. Is your practice general or limited to a specialty?.....	
5. Please name specialty.....	
6. After how many years of general practice did you limit your practice to a specialty?	
7. Are you doing general practice but giving special attention to a specialty?.....	
8. Please name specialty.....	
9. If practice is now limited to a specialty, do you contemplate such limitation?	
10. When?	
11. Do you hold a full time salaried position?.....	
What is the nature of the work?.....	
12. Do you hold a part time salaried position?.....	
What is the nature of the work?.....	

Remarks:

Lists of graduates were received from fifty-two different medical colleges. A total of 4,399 questionnaires was sent out. Of these 2,905, or 66 per cent were filled out and returned. An unusually fine spirit of cooperation and interest in the study was evidenced by those returning the questionnaires. This is worthy of mention in that it is generally recognized by statisticians that information thus given is very reliable. Table 1 shows by colleges the number of questionnaires sent out and the number and per cent returned. As shown in this table

*Read at the Thirty-Seventh Annual Meeting of the Association of American Medical Colleges held in Cleveland, Ohio, Oct. 25 and 26, 1926.

TABLE I—NUMBER AND PER CENT OF QUESTIONNAIRES RETURNED BY
MEDICAL COLLEGE GRADUATES, ACCORDING TO COLLEGE*,
1915 AND 1920

Medical Colleges	Total Questionnaires				1915 Questionnaires				1920 Questionnaires			
	Sent out**	Re- turned	% Returned		Sent out**	Re- turned	% Returned		Sent out**	Re- turned	% Returned	
All colleges*	4399	2905	66.0		2082	1379	66.2		2317	1526	65.9	
Jefferson	293	202	68.9		131	92	70.2		162	110	67.9	
Johns Hopkins	181	131	72.4		83	62	74.7		98	69	70.4	
Rush	189	125	66.1		84	59	70.2		105	66	62.9	
Harvard	173	120	69.4		80	54	67.5		93	66	71.0	
Bellevue	196	119	60.7		87	60	69.0		109	59	54.1	
Columbia	170	119	70.0		80	54	67.5		90	65	72.2	
Pennsylvania	183	115	62.8		54	35	64.8		129	80	62.0	
Emory	177	103	58.2		146	83	56.8		31	20	***	
Tulane	152	95	62.5		71	46	64.8		81	49	60.5	
Long Island	146	81	55.5		70	40	57.1		76	41	53.9	
Michigan	115	78	67.8		42	27	***		73	51	69.9	
Minnesota	96	78	81.3		34	28	***		62	50	80.6	
Maryland	118	75	63.0		66	42	63.6		53	33	62.3	
St. Louis	99	74	74.7		39	31	***		60	43	71.7	
Buffalo	110	73	66.4		53	37	69.8		57	36	63.2	
Northwestern	108	71	65.7		42	26	***		66	45	68.2	
Tufts	140	70	50.0		61	29	47.5		79	41	51.9	
Texas	98	66	67.3		33	26	***		65	40	61.5	
Western Reserve	84	62	73.8		32	27	***		52	35	67.3	
Medical College of Virginia	110	60	54.5		88	47	53.4		22	13	***	
Washington	71	57	80.3		29	25	***		42	32	***	
Iowa	75	53	70.7		22	18	***		53	35	66.0	
Albany	66	48	72.7		46	33	71.7		20	15	***	
Indiana	67	48	71.6		27	22	***		40	28	***	
Ohio State	64	48	75.0		42	30	***		22	18	***	
Vermont	54	45	83.3		38	28	***		21	17	***	
Detroit	78	44	56.4		39	20	***		39	24	***	
Louisville	75	44	58.7		39	32	***		26	12	***	
Craigton	59	41	69.5		36	26	***		23	15	***	
University of Virginia	52	41	78.8		25	17	***		27	24	***	
Syracuse	47	39	***		12	9	***		35	30	***	

Creighton --- 59 41 69.5 36 28 12
 University of Virginia --- 52 41 78.8 25 27 15
 Syracuse --- 47 39 *** 12 9 30

Nebraska	49	36	***	10	7	***	39	29	***
Pittsburgh	43	35	***	10	7	***	33	28	***
Hahnemann	56	34	60.7	20	10	***	36	24	***
Baylor	46	29	***	16	10	***	30	19	***
George Washington	45	28	***	23	18	***	22	15	***
Georgetown	42	27	***	27	19	***	15	8	***
Marquette	37	27	***	25	17	***	12	10	***
Stanford	35	27	***	16	13	***	19	14	***
South Carolina	39	25	***	24	16	***	15	10	***
Oklahoma	33	22	***	18	13	***	15	9	***
California	32	21	***	11	10	***	21	11	***
Kansas	31	21	***	10	6	***	21	15	***
Colorado	26	19	***	8	5	***	18	14	***
Georgia	26	18	***	11	8	***	15	10	***
Boston	30	18	***	19	12	***	11	6	***
Woman's Medical College	36	18	***	26	14	***	10	4	***
Yale	25	18	***	7	6	***	18	12	***
Medical Evangelists	28	17	***	12	8	***	16	9	***
Howard	43	17	***	20	5	***	28	12	***
Oregon	38	14	***	16	7	***	12	7	***
Arkansas	17	9	***	17	9	***	12		***

*No questionnaires were received from graduates of the following medical colleges: Loyola University; University of Illinois; Cornell University; University of Cincinnati; Meharry Medical College; University of Tennessee; Vanderbilt University.
 **Not quite all medical college graduates were sent questionnaires; a very small number were known to be deceased and still fewer had no definite address.
 ***Per cent not shown when base is less than 50.

the questionnaires returned show a relatively uniform distribution both as regards the colleges represented and years of graduation.

Whether or not there was a tendency for certain types of graduates to fill out and return the questionnaires in larger numbers than other types cannot be stated but such a possibility must be kept in mind in evaluating the results obtained.

Sex—As shown in table 2, 3.1 per cent of the 1915 graduates and 2.7 per cent of the 1920 graduates replying were women. Separate tabulation of the women graduates tended to show no way in which they as a group affected the results of the study. They have been included in all of the tabulations and will not be considered separately in this report.

TABLE 2—MEDICAL COLLEGE GRADUATES ACCORDING TO SEX:
1915 AND 1920

Sex	1915 graduates		1920 graduates	
	Number	% Distribution	Number	% Distribution
Both sexes -----	1379	100.0	1526	100.0
Men -----	1336	96.9	1485	97.3
Women -----	43	3.1	41	2.7

Age—The ages given indicate that the 1920 graduates averaged at the time of graduation somewhat older than the graduates of 1915. In table 3, which gives the graduates of the two years according to five year age periods, it is shown that 26.7 per cent of 1915 graduates are between 30 and 34 years of age, while but 21 per cent of 1920 graduates fall in the corresponding age period of 25 to 29 years. As one would expect the graduates from certain colleges average older than the graduates of others.

TABLE 3—MEDICAL COLLEGE GRADUATES TO AGE PERIOD;
1915 AND 1920.

Age period—	1915 Graduates		1920 Graduates	
	Number	Per Cent Distribution	Number	Per Cent Distribution
All ages -----	1379	100.0	1526	100.0
25 to 29 years -----			320	21.0
30 to 34 years -----	368	26.7	997	65.3
35 to 39 years -----	810	58.7	166	10.9
40 to 44 years -----	139	10.1	23	1.5
45 to 49 years -----	40	2.9	6	0.4
50 years and over -----	9	0.7	1	0.1
Age not reported -----	13	0.9	13	0.9

Distribution—In this study the distribution of the graduates according to the community in which they are practicing was not carried out for the smaller communities. It was felt that probably more reliable information in regard to this matter might be secured from other sources. Table 4 gives the distribution of the graduates in so

TABLE 4—MEDICAL COLLEGE GRADUATES, ACCORDING TO COMMUNITY IN WHICH THEY ARE PRACTISING: 1915 AND 1920.

Community	Graduates of Both Years		1915 Graduates		1920 Graduates	
	Number	Per Cent Distribution	Number	Per Cent Distribution	Number	Per Cent Distribution
All communities -----	2905	100.0	1379	100.0	1526	100.0
Cities of 500,000 population and over -----	847	29.2	379	27.5	468	30.7
Cities of 100,000 to 500,000 population -----	544	18.7	265	19.2	279	18.3
Balance of states -----	1469	50.6	713	51.7	756	49.5
Foreign countries -----	45	1.5	22	1.6	23	1.5

far as communities of less than or more than 100,000 population and foreign countries are concerned. As shown in this table about 50 per cent of the graduates of each year are located in communities of less than 100,000 population. The distribution of the graduates of the individual colleges for the years 1915 and 1920 is shown in table 5.

TABLE 5—MEDICAL COLLEGE GRADUATES PRACTISING IN SPECIFIED COMMUNITIES, ACCORDING TO COLLEGE: 1915 AND 1920.

Medical College	Total		Cities of 500,000 & over		Cities of 100,000 to 500,000		Balance of States		Foreign Countries	
	1915	1920	1915	1920	1915	1920	1915	1920	1915	1920
All colleges -----	1379	1526	379	468	265	279	713	756	22	23
Jefferson -----	92	110	26	25	12	17	51	63	3	5
Rush -----	59	66	5	18	11	8	43	40	---	---
Hopkins -----	62	69	30	30	14	20	17	19	1	---
Harvard -----	54	66	16	32	14	12	23	22	1	---
Bellevue -----	60	59	44	42	7	8	9	9	---	---
Columbia -----	54	65	32	39	6	12	16	13	---	1
Pennsylvania -----	35	80	9	23	4	6	21	51	1	---
Emory -----	83	20	2	2	15	5	65	13	1	---
Tulane -----	46	49	1	4	11	14	34	30	---	1
Long Island -----	40	41	31	35	2	2	7	4	---	---
Michigan -----	27	51	5	14	8	9	12	26	2	2
Minnesota -----	28	50	1	5	15	19	12	26	---	---
Texas -----	26	40	2	4	10	12	14	22	---	2
Maryland -----	42	33	10	9	10	4	22	20	---	---
St. Louis -----	31	43	10	17	3	4	18	20	---	2
Northwestern -----	26	45	6	10	3	9	17	26	---	---
Tufts -----	29	41	10	7	8	7	9	26	2	1
Western Reserve -----	27	35	13	16	4	4	9	14	1	1
Med. Coll. of Va. -----	47	13	6	1	9	3	32	9	---	---
Albany -----	33	15	4	2	3	3	26	10	---	---
Ohio State -----	30	18	3	2	10	6	17	10	---	---
Vermont -----	28	17	1	3	7	1	19	13	1	---
Detroit -----	20	24	12	18	1	---	7	5	---	1
Louisville -----	32	12	4	---	9	1	19	11	---	---
Creighton -----	26	15	---	1	6	3	20	11	---	---

(Continued on Page 34)

Univ. of Virginia	17	24	6	2	4	8	7	14		
Iowa	18	35	4	4	1	5	13	25		1
Syracuse	9	30	2	6	5	10	2	14		
Hahnemann	10	24	1	8	2	3	7	13		
Nebraska	7	29	1	2	3	9	3	18		
Indiana	22	28	1	3	9	5	12	20		
Buffalo	37	36	19	16	4	4	14	16		
Washington	25	32	8	11	2	3	11	17	4	1
Pittsburgh	7	26	3	11	1	1	3	14		
Baylor	10	19			1	11	9	7		1
Georgetown	19	8	9	5	4	2	6	1		
George Washington	13	15	5	4	2	2	6	8		1
Marquette	17	10	6	8	1		10	2		
South Carolina	15	10	1				14	10		
Stanford	13	14	6	7	2		3	7	2	
California	10	11	9	6		3	1	2		
Oklahoma	13	9	1		1	2	11	7		
Kansas	6	15		3	3	2	3	10		
Colorado	5	14			3	8	2	6		
Georgia	8	10			1	1	7	9		
Boston	12	6	6	1			5	5	1	
Woman's Med. Coll.	14	4	4	1	3		7	3		
Yale	6	12		3	5	3	1	5		1
Coll. Med. Evangelists	8	9	3	2			3	5	2	2
Howard	5	12	1	6	1	3	3	3		
Oregon	7	7			5	5	2	2		
Arkansas	9						9			

Types of Practice—According to type of practice the graduates were divided into three groups: those in general practice; those in general practice but giving special attention to a specialty; and those who had limited their practice to a specialty. An effort was thus made to separate from the specialists those who, although giving special attention to a specialty, had not limited their practice to it. A certain number of these are listed in medical directories as specialists. Table 6

TABLE 6—MEDICAL COLLEGE GRADUATES, ACCORDING TO TYPE OF PRACTICE: 1915 AND 1920.

Type of practice	Graduates of both years		1915 graduates		1920 graduates	
	No.	Per Cent Distribution	No.	Per Cent Distribution	No.	Per Cent Distribution
All types	2905	100.0	1379	100.0	1526	100.0
General practice	655	22.5	305	22.1	350	22.9
General practice but special attention to specialty	1095	37.7	477	34.6	618	40.5
Limited to specialty	1137	39.1	586	42.5	551	36.1
Not practicing	18	0.6	11	0.8	7	0.5

shows the number and per cent of graduates for both 1915 and 1920 according to the type of practice they are carrying on. In considering

this tabulation it is important to bear in mind that while the 1915 graduates have been eleven years out of college the 1920 graduates have been out only six years. Hence, the figures for the graduates of the two years as given here are not comparable. The fact that 42.5 per cent of the 1915 graduates have limited their practice to a specialty as compared with 36.1 per cent of the 1920 graduates by no means indicates a greater tendency toward specialization on the part of the 1915 graduates. On the other hand, if we include the 1920 graduates who have indicated their intention to limit their practice within the next five years, as shown in table 7, we find that 51 per cent of the 1920

TABLE 7—1920 GRADUATES WHO WILL HAVE LIMITED PRACTICE TO A SPECIALTY ELEVEN YEARS AFTER GRADUATION AS COMPARED WITH 1915 GRADUATES.

	1915 graduates	1920 graduates
Total	1379	1526
Graduates now limiting practice	586	551
1920 graduates now giving special attention to specialty who contemplate limitation within five years		177
1920 graduates doing general practice who contemplate limitation within five years		51
Total 1920 graduates who plan to limit practice by 1931		779
Per cent of graduates specializing eleven years after graduation	42.5	51.0

graduates will have limited their practice to a specialty when they are eleven years out of college as the 1915 graduates now are.

Carrying this tabulation still further and listing the graduates of both years who contemplate limiting their practice at any time in the future, we have figures which, although they may be undependable as far as accurate prognostication is concerned, at least indicate the present tendencies of the graduates. Such figures are given in table 8 and

TABLE 8—GRADUATES WHO WILL EVENTUALLY LIMIT THEIR PRACTICE TO A SPECIALTY IF THEY CARRY OUT THEIR PRESENT PLANS.

	Graduates of both years	1915 graduates	1920 graduates
Total	2905	1379	1526
Graduates now limiting practice	1137	586	551
Now giving special attention to specialty who plan limitation	713	272	441
Now doing general practice who plan limitation	218	78	140
Total limiting or planning on limitation	2068	936	1132
Per cent eventually limiting to specialty	71.1	67.8	74.1

TABLE 9.—NUMBER AND PER CENT OF MEDICAL COLLEGE GRADUATES WHO
HAVE LIMITED THEIR PRACTICE TO A SPECIALTY, ACCORDING
TO COLLEGE: 1915 AND 1920.

Medical College	Graduates of Both Years				1915 Graduates				1920 Graduates			
	Total	Limiting to Specialty			Total	Limiting to Specialty			Total	Limiting to Specialty		
		No.	% of Total			No.	% of Total			No.	% of Total	
All colleges	2905	1137	39.1		1379	586	42.5		1526	551	36.1	
Jefferson	202	65	32.2		92	38	41.3		110	27	24.5	
Johns Hopkins	131	101	77.1		62	48	77.4		69	53	76.8	
Rush	125	63	50.4		59	28	47.5		66	35	53.0	
Harvard	120	70	58.3		54	33	61.1		66	37	56.1	
Bellevue	119	32	26.9		60	23	38.3		59	9	15.3	
Columbia	119	54	45.4		54	26	48.1		65	23	35.4	
Pennsylvania	115	45	39.1		35	17	*		80	28	35.0	
Emory	103	37	35.9		83	29	34.9		20	8	*	
Tulane	95	30	31.6		46	12	*		49	18	*	
Long Island	81	17	21.0		40	11	*		41	6	*	
Michigan	81	17	21.0		27	17	*		51	22	43.1	
Minnesota	78	39	50.0		28	12	*		50	24	48.0	
Maryland	75	27	36.0		42	14	*		33	13	*	
St. Louis	74	27	36.5		31	17	*		43	10	*	
Buffalo	73	23	31.5		37	15	*		36	8	*	
Northwestern	71	30	42.3		26	13	*		45	17	*	
Tufts	70	16	22.9		29	8	*		41	8	*	
Texas	66	28	42.4		26	15	*		40	13	*	
Western Reserve	62	25	40.3		27	12	*		35	13	*	
Med. Coll. of Va.	60	20	33.3		47	16	*		13	4	*	
Washington	57	23	40.4		25	7	*		32	16	*	
Iowa	53	22	41.5		18	9	*		35	13	*	
Albany	48	18	*		33	12	*		15	6	*	
Indiana	48	16	*		22	10	*		26	6	*	
Ohio State	48	18	*		30	14	*		18	4	*	
Vermont	45	15	*		28	10	*		17	5	*	
Detroit	44	11	*		20	4	*		24	7	*	
Louisville	44	12	*		32	10	*		12	2	*	

Vermont	45	15	*	28	10	*	17	5	*
Detroit	44	11	*	20	4	*	24	7	*
Louisville	44	12	*	32	10	*	12	2	*
Creighton	41	9	*	26			15	4	*
Univ. of Va.	41	30	*	17	12		24	18	*
Syracuse	39	16	6	9	5		30	11	*
Nebraska	36	8	*	7	2		29	6	*
Pittsburgh	35	10	*	7	2		28	8	*
Hahnemann	34	5	*	10	2		24	3	*
Baylor	29	9	*	10	3		19	6	*
George Washington	28	11	*	13	5		15	6	*
Georgetown	27	12	*	19	10		8	2	*
Marquette	27	10	*	17	4		10	6	*
Stanford	27	12	*	13	4		14	8	*
South Carolina	25	9	*	15	7		10	2	*
Oklahoma	22	7	*	13	4		9	3	*
California	21	13	*	10	6		11	7	*
Kansas	21	8	*	6	4		15	4	*
Colorado	19	8	*	5	3		14	5	*
Georgia	18	7	*	8	2		10	5	*
Boston	18	8	*	12	7		6	1	*
Woman's Med. Coll.	18	7	*	14	5		4	2	*
Yale	18	8	*	6	4		12	4	*
Coll. Med. Evangelists	17	4	*	8	3		9	1	*
Howard	17	3	*	5	1		12	2	*
Oregon	14	5	*	7	3		7	2	*
Arkansas	9	3	*	9	3			--	*

*Percent not shown when base is less than 50.

indicate a somewhat greater tendency toward specialization on the part of the 1920 graduates.

In table 9 are listed according to the college from which they graduated those who have, up to now, limited their practice. Considerable variation is evident as to the per cent of graduates of the various colleges who have limited their practice. The graduates of Johns Hopkins Medical School show the largest per cent of specialists for both the years 1915 and 1920. In the case of many of the colleges the numbers of graduates returning the questionnaires were so small that comparative statements as to the tendency toward specialization on the part of their graduates are wholly unwarranted.

The classification of the specialties to which graduates are limiting their practice presented certain difficulties. From the detailed tabulation the classification shown in table 10 was adopted because it

TABLE 10—MEDICAL COLLEGE GRADUATES WHO HAVE LIMITED THEIR PRACTICE, ACCORDING TO SPECIALTY: 1915 AND 1920

Specialty	Graduates of both years		1915 graduates		1920 graduates	
	No.	Per Cent Distribution	No.	Per Cent Distribution	No.	Per Cent Distribution
All specialties.....	1137	100.0	586	100.0	551	100.0
Internal medicine.....	218	19.2	114	19.5	104	18.2
Eye, ear, nose and throat..	214	18.8	129	22.0	85	15.4
Surgery.....	205	18.0	115	19.6	90	16.3
Pediatrics.....	95	8.4	34	5.8	61	11.1
Gynecology and obstetrics..	79	6.9	39	6.7	40	7.3
Neuropsychiatry.....	66	5.8	30	5.1	36	6.5
Genito-urinary.....	58	5.1	25	4.3	33	6.0
Laboratory.....	49	4.3	20	3.4	29	5.3
Radiology.....	47	4.1	25	4.3	22	4.0
Public health.....	37	3.3	18	3.1	19	3.4
Industrial med. and surg..	21	1.8	14	2.4	7	1.3
Syphilology & dermatology..	16	1.4	5	0.9	11	2.0
Hospital administration..	12	1.1	6	1.0	6	1.1
All other specialties.....	20	1.8	12	2.0	8	1.5

is simple and because all but 20 of the 1,137 specialties listed seemed to justifiably fit into it.

It did not appear to be practical to publish the detail tables from which this classification was made. However, the specialists as listed in the returned questionnaires for two of the classes in table 10 may be of some value in interpreting the table. Under internal medicine the total of 218 was made up of the following: Internal medicine (not otherwise specified), 128; diseases of the chest, 35; diagnosis, 14; gastro-enterology, 10; internal medicine and pathology, 6; cardiology, 6; metabolic diseases, 5; heart and lungs, 3; internal medicine and radiology, 3; internal medicine and pediatrics, 2; gastro-enterology and radiology, 2; tuberculosis and physiotherapy, internal medicine and

dermatology, endocrinology, internal medicine and genito-urinary diseases, each 1.

Under eye, ear, nose and throat are included 214 reported as follows: Eye, ear, nose and throat, 140; ear, nose and throat, 474; eye, 27.

Where a double specialty such as "pediatrics and cardiology" or "pediatrics and laboratory" was reported, it was classified under what seemed most likely to comprise the major specialty. Where such assignment seemed to present difficulties as in the case of five who reported their specialty as "pediatrics and obstetrics," they were classified under "all other specialties." As mentioned above, this group totaled twenty and included in addition to the double specialties such unusual ones as "aviation medicine," "geriatrics," "homeopathic medicine and urinalysis" and "healing leg ulcers."

Comparison of the figures in table 10 for the 1915 graduates and the 1920 graduates shows, in general, a very similar distribution among the specialties of those who have limited their practice.

As one would naturally expect a larger per cent of those practicing in the larger communities have limited their practice to a specialty than of those practicing in the smaller communities. Table 11 gives the number and per cent who have limited their practice according to the size of the community in which they are practicing. The tabulation shows that practically 50 per cent of the graduates of both years who are practicing in communities of 100,000 or over have limited their practice to a specialty as compared with 29.5 per cent of those practicing in smaller communities.

General Practice as a Preliminary to Specialization—In considering the tabulation of the answers to question 6 of the questionnaire—"After how many years of general practice did you limit your practice to a specialty?"—it is important to bear in mind that although the question is apparently entirely clear, no information in regard to hospital internships was asked for. Table 12 gives the results of this tabulation and shows that 33.4 per cent of the 1915 graduates now limiting to a specialty had no preliminary general practice and that 53.7 per cent of the 1920 graduates now limiting to a specialty had none. Here, again, the figures for the graduates of the two years are not comparable because the per cents for the 1920 graduates are calculated from a base representing those who have specialized during their first six years after graduation as compared with eleven years for the 1915 graduates. But even considering the 296 graduates of 1920 who limited to a specialty having had no previous general practice and figuring the per cent from the base 779 (table 7—Total 1920 graduates who plan to limit practice by 1931), the result is 38 per cent as compared to the comparable figure of 33.4 per cent for the 1915 graduates. This seems to indicate a somewhat greater tendency on the part of the 1920 graduates to enter a specialty without preliminary general practice. The detail tables for the graduates of the individual colleges which are not published here indicate a tendency toward early specialization on the

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TABLE 11—NUMBER AND PER CENT OF MEDICAL COLLEGE GRADUATES
WHO HAVE LIMITED THEIR PRACTICE TO A SPECIALTY, ACCORDING
TO THE COMMUNITY IN WHICH THEY ARE PRACTICING:
1915 AND 1920.

Community	Graduates of Both Years				1915 Graduates				1920 Graduates			
	Total	Limiting to Specialty			Total	Limiting to Specialty			Total	Limiting to Specialty		
		No.	% of Total	% of Specialty		No.	% of Total	% of Specialty		No.	% of Total	% of Specialty
All communities-----	2905	1137	39.1		1379	586	42.5		1526	551	36.1	
Cities of 500,000 population and over-----	847	419	49.5		379	206	54.4		468	213	45.5	
Cities of 100,000 to 500,000 pop- ulation-----	544	271	49.8		265	149	56.2		279	122	43.7	
Balance of states-----	1469	433	29.5		713	221	31.0		756	212	28.0	
Foreign countries-----	45	14	31.1		22	10	*		23	4	*	

*Percent not shown when base is less than 50.

TABLE 12—MEDICAL COLLEGE GRADUATES WHO HAVE LIMITED THEIR PRACTICE TO A SPECIALTY, ACCORDING TO YEARS OF GENERAL PRACTICE: 1915 AND 1920.

Years of general practice	1915 graduates		1920 graduates	
	Number	Per Cent distribution	Number	Per Cent distribution
All specialists-----	586	100.0	551	100.0
No general practice-----	196	33.4	296	53.7
Under two years-----	34	5.8	77	14.0
Two to four years-----	134	22.9	143	26.0
Five to nine years-----	187	31.9	22	4.0
Ten years and over-----	22	3.8		
Time not reported-----	13	2.2	13	2.4

part of the graduates from certain colleges.

Graduates holding salaried positions—As indicated in table 13, 16.9 per cent of the graduates of both years are now occupying full-time salaried positions and 19 per cent part-time salaried positions.

TABLE 13—MEDICAL COLLEGE GRADUATES, ACCORDING TO KIND OF SALARIED POSITION: 1915 AND 1920.

Kind of Position	Graduates of both years		1915 graduates		1920 graduates	
	No.	Per Cent Distribution	No.	Per Cent Distribution	No.	Per Cent Distribution
Total-----	2905	100.0	1379	100.0	1526	100.0
With full-time position---	430	16.9	216	15.7	271	17.8
With part-time position--	553	19.0	239	17.3	316	20.7
With no salaried position--	1862	64.1	924	67.0	939	61.5

It is difficult to state whether or not the figures for the graduates of the two years, which show a somewhat larger per cent of the 1920 graduates holding salaried positions, are comparable. However, the fact that 15.7 per cent of the 1915 graduates are now holding full-time salaried positions is striking evidence of a tendency toward the salaried physician. The detail tabulation shows here again apparent tendencies on the part of the graduates of certain colleges. Of the 1920 graduates reporting from one college 43.4 per cent are now holding full-time salaried positions.

Tabulations were made of all of those holding full-time and part-time salaried positions according to the type of practice which they had reported and the results are given in table 14. Here is shown as might be expected, that a much greater number of those limiting their practice are holding salaried positions than those in general practice or in general practice and giving special attention to a specialty. In the second subdivision of this table it is shown that 25.4 per cent of the

1915 graduates and 35.9 per cent of the 1920 graduates limiting their practice to a specialty are holding full-time salaried positions.

As shown in the third subdivision of table 14 there is a more uniform distribution of those holding part-time salaried positions, between those specializing and those not specializing. A somewhat larger per cent of the 1920 graduates who have not limited their practice are holding part-time salaried positions than of the similar group of 1915 graduates.

TABLE 14—NUMBER AND PER CENT OF GRADUATES HOLDING SALARIED POSITIONS, ACCORDING TO TYPE OF PRACTICE: 1915 AND 1920.

Type of practice	1915 Graduates			1920 Graduates		
	Total	With any salaried position		Total	With any salaried position	
		No.	% of Total		No.	% of Total
All types-----	1379	455	33.0	1526	587	38.5
General practice-----	305	62	20.3	350	86	24.6
General practice, but special attention to specialty-----	47	131	27.5	618	203	32.8
Limited to specialty---	586	261	44.5	551	298	54.1
Not practicing-----	11	1	*	7		

Type of practice	1915 Graduates			1920 Graduates		
	Total	With full-time salaried position		Total	With full-time salaried position	
		No.	% of Total		No.	% of Total
All types-----	1379	216	15.7	1526	271	17.8
General practice-----	305	23	7.5	350	28	8.0
General practice, but special attention to specialty-----	477	43	9.0	618	45	7.3
Limited to specialty---	586	149	25.4	551	198	35.9
Not practicing-----	11	1	*	7		

Type of practice	1915 Graduates			1920 Graduates		
	Total	With part-time position		Total	With part-time position	
		No.	% of Total		No.	% of Total
All types-----	1379	239	17.3	1526	316	20.7
General practice-----	305	39	12.8	350	58	16.6
General practice, but special attention to specialty-----	477	88	18.4	618	158	25.6
Limited to specialty---	586	112	19.1	551	110	18.1
Not practicing-----	11			7		

*Not shown with so small a base.

In table 15 are tabulated according to the specialties the number of those limiting their practice together with the number holding full-

TABLE 15.—GRADUATES LIMITING PRACTICE WITH FULL-TIME AND PART-TIME POSITIONS ACCORDING TO SPECIALTY: 1915 AND 1920.

Specialty	1915 Graduates				1920 Graduates			
	Total		With Full Time Position		Total		With Full Time Position	
All specialties	586	149	112	551	198	100		
Eye, ear, nose and throat	129	12	17	85	6	8		
Internal medicine	114	22	24	104	46	21		
Surgery	115	30	30	90	32	16		
Pediatrics	34	2	10	61	10	23		
Gynecology and obstetrics	39	3	6	40	3	9		
Neuropathology	30	17	2	36	24	6		
Genito-urinary	25	1	8	33	5	9		
Radiology	25	7	7	22	11	3		
Laboratory	20	14	3	29	25	4		
Public Health	18	17	1	19	19			
Industrial medicine and surgery	14	8	2	7	6			
Syphilology and dermatology	5	1	2	11	1	1		
Hospital administration	6	6		6	6			
All other specialties	12	9		8	4			

time and part-time positions. This table shows that a certain number from each of the specialties are holding full-time salaried positions. In certain of the specialties such as public health and hospital administration, practically all, and in other specialties such as neuropsychiatry, laboratory and industrial medicine, a large per cent are occupying full-time positions.

The nature of the work of those holding full-time and part-time salaried positions together with the number holding each kind of position is shown in table 16.

TABLE 16—MEDICAL COLLEGE GRADUATES ACCORDING TO KIND OF SALARIED POSITION: 1915 AND 1920.

Salaried Position	Medical college graduates of both 1915 and 1920	
	Full-time	Part-time
All positions.....	487	555
Hospital.....	100	47
University (teaching and research).....	36	89
Hospital and university.....	21	16
Industrial.....	35	65
Public Health.....	43	86
U. S. Public Health Service.....	16	3
Other governmental*.....	—	4
State Departments.....	5	9
City or county departments.....	16	68
Public Health**.....	6	2
School medical inspection.....	7	53
Group practice.....	49	1
Assistant to other physician.....	29	16
Veterans' Bureau.....	23	15
Army.....	33	—
Navy.....	23	1
Insurance.....	8	20
Laboratory.....	14	14
Railroad.....	2	28
Sanatorium (TB.).....	19	5
Other institutions***.....	7	9
Clinic service.....	2	28
Medical research**.....	8	2
Medical missionary.....	5	—
Dispensary.....	—	6
All other positions.....	1	1
Two or more positions.....	15	42
Position not reported.....	7	13

*Federal.

**Not otherwise specified.

***Except hospital and sanatoria.

As one might expect, university and hospital positions account for a large per cent of the full-time positions reported. Of the total 157 such full-time positions reported, 54 are occupied by 1915 graduates and 103 by 1920 graduates. Of the 43 full-time public health positions, 19 are held by the 1915 graduates and 24 by 1920 graduates. The 1920

graduates also hold a larger number of the group practice and "assistant to other physician" positions. On the other hand, a larger number of the Veterans' Bureau, army, navy and industrial positions are held by 1915 graduates.

In this connection it should be pointed out that in considering the whole subject of specialization in medicine it is important to bear in mind that a considerable number of those who have limited to a specialty are not in the private practice of medicine but are occupying full-time salaried positions.

With this idea in mind it can be seen that although table 6 correctly classifies the graduates according to type of practice, it does not give a true picture of the extent of specialization on the part of the graduates who are in the private practice of medicine. In order to get such a picture it is necessary to eliminate from table 6 all of those of each group who are holding full-time salaried positions and also those not practicing. Such elimination gives the figures shown in table 17. Comparison of tables 16 and 17 suggests that there is some

TABLE 17—MEDICAL COLLEGE GRADUATES WHO ARE PRACTICING AND WHO ARE NOT HOLDING FULL-TIME POSITIONS, ACCORDING TO TYPE OF PRACTICE: 1915 AND 1920.

	Graduates of both years		1915 graduates		1920 graduates	
	No.	Per Cent Distribution	No.	Per Cent Distribution	No.	Per Cent Distribution
All types.....	2401	100.0	1153	100.0	1248	100.0
General practice.....	604	25.2	282	24.4	322	25.8
General practice but special attention to specialty.....	1007	41.9	434	37.6	573	45.9
Limited to specialty.....	790	32.8	437	37.9	353	28.2

relationship between the full-time salaried physician and the extent of specialization in medicine.

The proper evaluation of the results of such a study as here reported is difficult because of a considerable number of complicating factors. The results do suggest that the demands made by society on the medical graduate have a very definite influence on the trend of medicine. The medical profession should endeavor to see to it that society is so educated that these demands will be in the best interest of the individual and of society as a whole.

It is with pleasure that I express appreciation to Miss Mary V. Dempsey, statistician for the Syracuse Health Demonstration, for the great assistance rendered in the tabulation of the information furnished by those returning the questionnaires.

DISCUSSION

DR. NATHAN P. COLWELL, American Medical Association, Chicago: There appears to have been a rapid trend toward specialization during the last several years, due evidently to influences exerted during the World War when there was an urgent demand for physicians highly skilled in various narrow specialties. At the present time many graduates enter on courses leading to specialization immediately after finishing their general internship by continuing in residencies in various specialties or fellowships such as are given at the Mayo Foundation. In such hospitals the students stay for one, two or three years in their residencies or higher internships. It is not surprising, therefore, to note the figures in Dr. Weiskotten's paper indicating that since 1920 increased numbers have gone immediately into specialization.

Inasmuch as the field of medical knowledge has increased in breadth and complexity, there seems to be some justification for specialization and without doing this no one can attain to a very high degree of skill. After all the danger is not from the fact that physicians in larger numbers enter on specialization, but from physicians who pose as specialists without first obtaining the essential knowledge and increased skill.

DR. GEORGE M. KOBER, Georgetown University, Washington, D. C.: It occurred to me that we, as medical educators ought to be very careful in giving advice to our graduates about entering permanently into the various specialties. Personally, I am convinced that our best specialists are those who have at least had five or six years of general experience as practitioners. I think it is a great mistake to encourage in any way, shape or manner, young men who enter the medical field to specialize too early in their student and professional career.

DR. W. C. RAPPLEYE, Commission on Medical Education, New Haven, Conn.: I want to say something about the distribution of these men in relation to size of communities. We want to learn whether or not the recent graduate is going to the larger community. Practically 11 per cent of the class of 1915 went to the smaller communities, up to 1,000 or less, whereas 9 per cent only in the class of 1920 did so. There are 15,000 men in the country who restrict themselves to a specialty. That represents about 12 per cent of the active practitioners. We were interested in knowing whether the percentage of recent graduates maintained that rate or if it was higher. We took a certain number of states, like Indiana, Louisiana, Kentucky, Connecticut and Wisconsin. In Wisconsin, for instance, 16 per cent were restricting themselves to specialties. Those were the graduates of fifteen years or more ago. In Louisiana, the figures were 19 per cent of the recent graduates and 11 per cent of the old graduates.

We also went one step further in the study of the graduates of 1906. We studied the graduates of 1901 and 1905, and the graduates of 1920 and 1923. We found in communities of over 50,000 in 1906, that 34 per cent of the physicians in these communities of 50,000 or more were graduates of from 1901 to 1906 and only 33 per cent of the graduates of that class were in those communities. In other words, at that time the recent graduates were apparently parallel with the general distribution. In 1923, 43.8 per cent of all medical graduates were in communities of 50,000 or more. In 1923, the graduates of 1916 and 1920 had distributed themselves to 57.8 per cent in communities of 50,000 or over. The recent graduates wanted to go to the larger communities. We have a number of other figures but that is a point that Dr. Weiskotten brought out that I wanted to comment on.

DR. H. G. WEISKOTTEN: Referring to what Dr. Colwell said, I think that is undoubtedly so. One bit of information that I did not get on our questionnaires was how much preparation a man had put in before limiting his prac-

tice to a specialty, that is either in hospitals or otherwise. I simply asked the practical question in regard to general practice. I am very glad that Dr. Rappleye worked this out for the smaller communities. In regard to the matter of specialization, we have to keep in mind that there may be a great tendency for certain groups to answer the questionnaires and it may be that those who have limited their practice to a specialty tended to answer the questionnaires more readily than those in general practice.

I might say that it has been rather interesting to do this. I have a number of tables that I did not show. I have all the information and I have all the tables worked out for each individual medical college and that gives some rather interesting information in regard to the tendency of the graduates of those schools.

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COST OF MEDICAL EDUCATION*

FRED C. ZAPFFE

Secretary, Association of American Medical Colleges

One of the most intriguing problems besetting medical educators is the cost of medical education. A real computation has never been attempted—nor can it be made until special systems of accounting are devised for the use of universities which will make it possible to construct an annual balance sheet as is done by industrial organizations. Until now, virtually only one item is considered—the budget or annual appropriation. Everything is subsidiary to the budget, and it is an important item for on it depends the carrying on of the year's activities.

This study is, so far as I am aware, the first attempt made to secure some data which will give an approximate idea of cost and which may serve as a starting point or stimulus for further investigations.

In soliciting the data for this study, the first and dominant impression I gained was that many medical schools are keenly interested in the cost of medical education per student. Several universities have figured out this item and some startling figures are given. One institution has even figured out the cost per student per instruction hour.

My experience derived from this study has confirmed my belief that exact figures cannot be obtained because it is impossible for an institution to estimate the cost of medical education. No data are reliable because they are not complete. The institutions have not yet trained accountants who can figure out exactly just what this cost is for the medical school. If you can get that cost, it is, of course, a simple matter to pro-rate the cost per student. The item of overhead is not accounted for at all, nor the cost of floor space, depreciation and many other items that usually appear in an audit.

In quite a few universities the so-called medical science subjects are offered as courses to which any student in the institution, undergraduate and graduate, is eligible and yet, as a rule, the cost of the course is charged to medical education. For instance, in anatomy, physiology and bacteriology, many of the students are not medical students. They may be taking these courses as a major or minor in graduate study, medical or nonmedical, or as a part of the course of other schools in the university. Then there is the item of research. In some schools the cost of research is included in the departmental budget. In only a few schools is there a separate appropriation for research. In some schools research is being conducted in the hospital which is a part of the school and the cost item is a part of the hospital maintenance budget.

*Read at the Thirty-Seventh Annual Meeting held in Cleveland, Oct. 25 and 26, 1928.

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COST OF MEDIC

Appropriation for 1926	ADDITIONAL EXPENSE		Appropriation for 1920	Appropriation for 1922	DEPARTMENTAL BUDGETS						
	Building	Equipment			Anatomy	Physiology	Pharmacology	Biochemistry	Pathology	Bacteriology	Pre-Medical
220,000			154,915	165,555	33,562	8,301	5,947	11,055	14,565	6,300	
188,195	207,941		156,607	138,330	32,870	12,300	10,130	12,900	16,210	10,175	
285,832				274,201	39,300	6,000		16,840	25,500	10,810	900
394,205	435,000		253,808	305,019	35,245	29,860	14,395	24,620			12,500
171,145			84,862	106,225	15,600		18,000	7,950	14,820	13,000	800
92,061		9,502	52,420	63,163	17,442		17,492	12,180		18,877	
90,380			72,793	82,910	8,500	2,100	600	2,200	5,200	3,600	500
182,474			110,916	117,984	22,450	17,000	11,750	10,850			1,550
626,574	900,000		425,891	480,318	47,896	30,016	30,966	19,240			School Hyg.
117,705			87,289	95,292	3,637	3,041	158	1,188		4,709	
130,150	10,000	2,000	60,000	75,000	21,950	14,650	11,200	11,700		18,500	1,250
274,109	Hosp. 415,000		296,031		46,500	*Chemistry 34,855	16,375	x	26,345	28,490	15,600
168,300			63,545	72,421	20,635		17,485	11,130	10,440		10,796
359,185	392,000	42,000	147,742	230,224	41,655	24,865	21,550	14,000	31,400		21,120
132,408	17,097		101,186	122,435	12,125	9,085	7,240	11,520		14,885	
135,936			88,435	133,435	17,385		17,170	14,360	11,690		8,280
253,450	3,000,000	250,000			20,000	20,000	14,000	18,000	20,000	11,000	10,000
131,846			64,000	102,000	19,500	11,735	8,445	10,150	17,100		8,500
154,025			104,952	132,421	19,908	12,763		14,850		13,500	
218,007	20,826		119,260	193,839	19,598	18,156	11,818	20,821	15,384	15,429	6,910
130,000		5,000	88,589	131,491	4,000	3,000	3,500	2,500	4,000	4,000	2,500
236,538	11,632				36,187	33,776	16,023	10,000	18,192	20,270	
506,478											
85,188		1,702	56,256	86,753							
166,250	450,000		125,954	183,390	33,450	16,450	20,600	3,000		39,710	
150,222			97,744	136,491	13,547		12,610	9,540		12,110	46,211
291,921											
93,650			58,311	78,067	19,600		12,775	6,650		13,000	2,975
		3,700									
40,000			25,000	35,000	11,220	1,800	1,600	1,800	5,000	3,500	400
140,195			80,650	117,450							
*21,674				54,633	10,000		14,067	7,445	11,031		
316,000	440,500	53,750	184,255	306,320	31,511	26,819	16,869	16,032		36,434	10,906
*19,050			9,750	16,475	6,005		4,230	*4,818	4,006	*With Biochem.	
*83,500			60,000	65,000	15,533		22,316		10,715		11,331
*58,320			40,000	45,000							
*22,740					7,700	4,620	4,725	2,980		4,935	
*16,050					1,350		6,550		5,850		
*50,000		10,500									
400,051	418,591	12,701	257,207	340,344	40,749	33,138	19,273	24,696	40,306	37,039	
117,835	4,742	8,966			15,062		12,633	9,207	15,982	10,162	
218,300		15,500	172,327	218,300	26,900	28,450	14,600	11,800		27,975	26,985
241,940			109,710	149,600	29,700	18,930	15,050	14,465	13,380		14,120
188,000					23,189		20,433	16,601	12,456	15,202	1,500

MEDICAL EDUCATION—Zapffe

EXPENSES						INCOME			ENDOWMENT		
Medicine	Surgery	Obstet. Gyn.	Other Depts.	Research	Hospital Expense	Student's Fees	Endow-ment	Other Sources	Medical School	Depart-mental	Special
	8,125	6,627	1,325		None	189,444	28,847		450,852		3 Chairs 278,000
	18,400	15,900	6,100	53,210	**	25,000		163,195			
00	58,550	31,792	21,920	21,270	20,899	54,561		50,000			
00	62,830	44,600	10,750	24,000	31,100	13,233	100,000	90,225	10,000	1,025,912	275,000 10,000
00	11,800	6,800	4,000	7,400	7,940	58,390	18,150		152,995		300
	9,876		960	13,425	890	2,880	69,202	25,000	203	25,000	390
00	12,000	8,000	3,000	5,000			60,854	6,898	22,627		
50	24,400	11,570	5,200		1,200		88,451	97,264	37,657	1,329,491	60,000 39,500
	211,482	108,871	34,666		**	88,000	453,350	56,101	4,814,000	3,890,000	275,000
	550	296	398		3,950	118,135		769	1,726		
50			21,200			43,000	16,000	71,150	260,000		
00	42,000	35,000	12,655		**	310,697	87,317		Hosp. (?)		3,000
	1,930	1,810	975	19,460	**	25,300		73,000	70,000		
	34,350	40,200	13,000	16,240		5,455	64,000	113,760	181,425	1,266,998	606,383
	2,450	6,285	3,920	31,135			63,750	57,747	10,975	2,000,000	
	11,725	12,700	3,200	6,200			35,690	27,500	72,744	500,000	
00	31,000	25,000	3,000			38,000	223,795		4,000,000	Hosp. 2,000,000	
	4,275	500	600	25,742	1,500	34,766	2,500	4,329		2,500	
	8,280	9,040	1,710	73,623	350	50,479		109,472		25,000	
10	25,508	23,928		60,456		73,472	150,930	20,726	1,140,438	1,217,640	704,285
00	4,300	4,000	3,500	2,700		50,000	32,000	36,000	67,000	615,000	Hosp. 5,000 50,000
	42,577	25,986	10,916	8,326	12,285	20,552	15,500	12,775	346,000	Hosp. 32,000	20,000
						55,906	198,543	75,000			
						51,811	162,000		3,252		
	70,000	47,000	15,500	12,220		75,790		12,500			
211	12,000	9,790	3,630	31,909		10,289	1,750	148,256			25,000
							102,018				
75	13,725	9,000	4,800	11,325	500	46,634		Hosp. 86,000			
						4,000					
00	8,600	4,300	2,600	1,500		39,785	6,893	8,000	182,790		
				12,090		24,790	29,843				
96	13,665	12,752	4,800	28,828	8,990	91,200	111,230	12,377	1,623,970	517,882	250,000
						4,000	15,050			For Whole Institution \$2,500,000	
	3,160			91,400		86,000	9,911	75,588			
							20,000	13,500	State App. 25,000		
	390						3,840		State 22,740		
						15,475					
	44,424	31,576	13,600	115,250		118,309	6,000	275,741			
	17,132	4,820	6,392	26,441		540,970	51,961	23,000	42,873		
985	48,050		38,950	9,575	12,000						
	32,000		6,000			150,000	12,000	700	240,000		
500	13,305	14,383	4,573	15,912		3,900	142,608	30,588	13,200	500,000	1,500

253,450	3,000,000	250,000			20,000	20,000	14,000	18,000	20,000	11,000	10,000
131,846			64,000	102,000	19,500	11,735	8,445	10,150	17,100		8,500
154,025			104,952	132,421	19,908	12,763	14,850			13,500	
218,007	20,826		119,260	193,839	19,598	18,156	11,818	20,821	15,384	15,429	6,910
130,000		5,000	88,589	131,491	4,000	3,000	3,500	2,500	4,000	4,000	2,500
236,538	11,632				36,187	33,776	16,023	10,000	18,192	20,270	
506,478											
85,188		1,702	56,256	86,753			Not Kept				
166,250	450,000		125,954	183,390	33,450	16,450	20,600	3,000	39,710		
150,222			97,744	136,491	13,547		12,610	9,540	12,110		46,211
291,921											
93,650			58,311	78,067	19,600	12,775		6,650	13,000		2,975
		3,700									
40,000			25,000	35,000	11,220	1,800	1,600	1,800	5,000	3,500	400
140,195			80,650	117,450							
*21,674				54,633	10,000	14,067		7,445	11,031		
316,000	440,500	53,750	184,255	306,320	31,511	26,819	16,869	16,032	36,434		10,996
*19,050			9,750	16,475	6,005	4,230		*4,818	4,006	*With Biochem.	
*83,500			60,000	65,000	15,533		22,316		10,715	11,331	
*58,320			40,000	45,000							
*22,740					7,700	4,620	4,725	2,980	4,935		
*16,050					1,350	6,550			5,850		
*50,000		10,500									
400,051	418,591	12,701	257,207	340,344	40,749	33,138	19,273	24,696	40,306	37,039	
117,835	4,742	8,966			15,062		12,633	9,207	15,982	10,162	
218,300		15,500	172,327	218,300	26,900	28,450	14,600	11,800	27,975		26,985
241,940			109,710	149,600	29,700	18,930	15,050	14,465	13,380	14,120	
189,000					23,189	20,433		16,601	12,456	15,202	1,500
172,000			125,000	156,000	14,758	9,180	12,569	8,565	18,066	7,551	17,232
87,085	100,000	25,000	53,829	61,869	19,502		10,537	8,091	9,045	10,573	
88,989			62,996	74,209	13,500		13,500	8,610		10,320	
173,617	1,004	2,095	163,323	166,798	22,430		23,855	7,825		30,695	9,500
95,867	70,000	8,000	53,686	67,581	14,450	14,336	9,000	6,000	13,050	12,825	
316,301	799,505	43,200	153,838	216,127	44,149	15,738	26,774	24,750	29,280		16,105
607,239			400,648	584,675	36,885	32,736	26,280	24,030	27,980	34,100	31,165
329,859	396,137	17,543		295,207	19,031	32,246	15,121		21,768	16,450	8,431
49,840			20,835	33,886	7,297	4,422	4,193	5,334	9,749		2,466
151,936			77,591	76,648	26,144	18,100	12,350	17,250	22,820		3,000
425,851			332,548	346,718	40,173	27,090	17,098	27,607	41,300	27,500	
100,920			44,572	84,413	19,217	10,866	12,290	8,500		11,725	
370,375			363,139	36,955	25,438		12,290	21,200	34,610	19,460	12,180
276,728	13,000	12,260	286,215	268,632	26,280	15,740	9,820	x	25,700		7,790
123,700											
110,139			43,189	66,278	16,765	17,375		7,050	20,315		1,250
11,394,835											

* 2 year schools.
* Included.

	12,720	12,700	3,200	6,200		38,000	27,500	72,744	500,000	
	31,000	25,000	3,000			38,000	223,795		4,000,000	Hosp. 2,000,000
	4,275	500	600	25,742	1,500 -	34,766	2,500	4,329		2,500
	8,280	9,040	1,710	73,623	350	50,479		109,472		25,000
	25,508	23,928		60,456		73,472	150,930	20,726	1,140,438	1,217,640 704,285
	4,300	4,000	3,500	2,700		32,000	36,000	67,000	615,000	Hosp. 5,000 50,000
	42,577	25,986	10,916	8,326	12,285	20,552	15,500	12,775	346,000	Hosp. 32,000 20,000
						55,906	198,543	75,000		
						51,811	162,000		3,252	
	70,000	47,000	15,500	12,220		75,790		12,500		
	12,000	9,790	3,630	31,909		10,289	1,750	148,256		25,000
							102,018			
	13,725	9,000	4,800	11,325	500	46,634		Hosp. 86,000		
						4,000				
	8,600	4,300	2,600	1,500		39,785	6,893	8,000	182,790	
				12,090		24,790	29,843			
	13,665	12,752	4,800	28,828	8,990	91,200	111,230	12,377	1,623,970	517,882 250,000
						4,000	15,050			For Whole Institution \$2,500,000
	3,160			91,400		86,000	9,911	75,588		
						20,000	13,500	State App. 25,000		
	390					3,840		State 22,740		
						15,475				
	44,424	31,576	13,600	115,250		118,309	6,000	275,741		
	17,132	4,820	6,392	26,441		51,961	23,000	42,873		
	48,050	38,950		9,575	12,000					
	32,000	6,000				150,000	12,000	700	240,000	
	13,305	14,383	4,573	15,912		3,900	142,608	30,588	13,200	500,000 1,500
	2,712	11,923				7,400	105,150		46,190	Scholarships 59,800
	22,704					12,000			70,000	
	43,049					2,100	5,741		81,341	
	11,460	2,960	14,850	27,730		26,500	44,156	18,332		160,154
				26,206		56,613	1,125	115,879	12,600	
	4,078	19,807	5,329	6,494		44,649		51,217		
	107,648	22,280			50,465	51,567		264,734		14,800
	54,510	29,680	5,775	56,752		164,537	543,303	33,697	10,715,134	
	14,600	13,040	2,924	3,504		43,240		286,819		
	4,803	1,900	2,335	7,337		89,240		11,566	135,979	2,000 16,701
	3,947	1,753		1,500	1,000	47,830		2,674		18,214
	41,467					70,763				
	64,392	50,319	19,900	14,820		32,160	103,000	211,319	111,532	1,947,375 2,279,000
	2,890					62,926	12,722	25,291	268,805	
	76,415	21,920	5,220	104,687		78,153	236,600	22,000		
	20,920	15,050	18,490	57,730		78,699	44,471	5,408		
									123,700	
	15,050	12,410	3,200			74,170		50,974		
						3,377,763				

of maintenance and students' fees are two very important items in this connection.

You will note that there is wide variation in these budgets. Some of them are very large. By contrast, some budgets appear to be rather small. The largest budget is \$626,574; the smallest is \$49,840. In the main, medical school budgets exceed \$100,000; many of them exceed \$200,000; some exceed \$300,000, and a few are even larger. I dare say that no school will admit that its budget is too large; in fact, always the contrary is asserted. The cost of medical education is high, although not excessive when compared with the cost of maintenance of other graduate schools in the university.

It is interesting to note the gradual increase in the budget from year to year. For instance, taking the school that had a \$607,000 budget for the current year, in 1920 the budget was \$400,000; in 1922 it was \$584,000. A school whose budget for this year was \$87,000, in 1920 was \$53,000 and in 1922 it was \$61,000. Another institution with a \$625,000 budget this year, went from \$425,000 in 1920 to \$480,000 in 1922. This increase in size of the budget is a uniform one in all the schools. In some schools there was a tremendous increase, as high as 50 per cent in five years.

The departmental budgets are also interesting but the figures are rather unreliable. Several institutions have a school of hygiene and public health which has a separate budget, often because the cost of maintenance, wholly or partly, comes out of a different fund than the general university appropriation. Some of these departmental budgets run rather high.

For instance, in the school that has a \$600,000 budget, the anatomy department has a budget of \$47,000. A school with a budget of \$117,000, gives as the budget for the anatomy department \$3,637; for physiology, \$3,041. A two year school with a budget of \$30,000 gives as the budget for the department of pharmacology \$158. Doubtless, there is something wrong here, although the question was asked plainly "What is the budget for the department of pharmacology?" Pharmacology is not tied up with physiology in this school. Another school asserts that for biochemistry the budget is \$1,200 and for pathology it is \$4,700. Compare these figures with those of some other schools. The difference is startling.

In research the figures were unusually small. That was for the reason that in some instances this item is included in a departmental budget. In other cases the smallness of the research fund is astonishing. A school with a budget of \$182,000, has definitely allotted only \$1,200 to research. Another school with a budget of \$154,000 has definitely allotted only \$354 to research.

I also tried to get the figures on the sources of income other than income from the students' fees. They were so unreliable that it is impossible to make use of the figures for purposes of computation.

In the matter of endowment, some very interesting figures were given, but again it could hardly be considered that the answers were entirely correct. Some schools have a very large endowment. The largest figure given is \$10,715,134. That endowment is for the medical school, not for the university. One school has an endowment for the medical school of \$4,814,000; a departmental endowment of \$3,890,000 and an endowment of \$275,000 for a special purpose. Thirty-four of the sixty colleges reporting have an endowment for some purpose. Three schools have an endowment for a hospital; one for the library and one for scholarships.

One school with a budget of \$218,000 has an endowment for the medical school of \$1,140,000, a separate departmental endowment of \$217,000 and an endowment of \$704,000 for special purposes.

One with a statistical bent of mind could draw many interesting lessons from this array of figures—but, in the main, they serve to illustrate well the impossibility of making even an approximate estimate of the cost of medical education to the university or to the state. No special mention is made of the huge sums of money that have been appropriated by the various foundations interested in this field for medical education, especially for the construction of new buildings, and many lesser sums given for a stated period of years to worthy medical schools whose sources of funds are restricted or limited to a small group but who, nevertheless, are serving a noble cause and are deserving of support.

Finally, there is the question of funds invested in property, buildings and equipment. These monies would, no doubt, carry the total well up into the millions, possibly into the billions.

Is this colossal expenditure warranted? Reviewing the many humanitarian activities of the profession that are the beneficiary of these expenditures, there can be but one answer—YES.

DISCUSSION

DR. S. P. CAPEN, University of Buffalo, Buffalo, N. Y.: I agree with Dr. Zapffe that university accounting is comparatively inaccurate and possibly it will never be wholly reliable. I once heard President Hadley say that the problem of cost accounting for a railroad system was simplicity itself in comparison with the problem of cost accounting for a university. Any one who has ever tried to arrive at accurate figures of either unit costs or curriculum costs will agree that there are so many variables that a perfectly defensible determination is impossible. Nevertheless I would like to indicate that if these budgets do not, as reported, include the medical school's estimated share of the general university overhead, that is a factor of very considerable importance which should be added if one is trying to get at even an approximate idea of the cost of educating a student for medicine. (And, of course, this statement applies equally to all other departments of a university.) Indeed, I should hazard a rough guess that if the overhead is not included in the budgets as reported to the secretary, to include it would send up the average

cost per student anywhere from \$75 to \$150 a year. While it is true that there are some departments of universities that cost more than medicine, it is also true that there are not many. Architecture in some institutions costs a little more. We know that it costs more to train a student for the Ph.D. degree and possibly the result at the end may not be so very satisfactory. But leaving those things out of account, the indisputable fact is that the actual cost of maintaining a medical school constitutes one of the heaviest financial burdens laid on any university and that the cost of educating one student for medicine is from a social as well as an institutional viewpoint a very serious thing.

COMBINED BACCALAUREATE COURSES.*

STUART GRAVES

University of Louisville School of Medicine

The lack of proper advice to prospective medical students regarding premedical studies is one defect in their premedical education which seems obvious from a study of the catalogs of 327 colleges and universities on the list of such approved institutions as compiled and published by the Council on Medical Education of the American Medical Association. The transactions of the Association of American Medical Colleges and other educational associations record in recent years many controversies about various features of premedical education, but it has apparently escaped notice that about one-third of the catalogs of institutions approved by the Council for premedical preparation offer no advice whatever on that subject, and 8 per cent more either barely mention or outline the minimum requirements without which any student cannot be admitted to any class A medical school. In other words, 43 per cent, almost one half, of the catalogs of approved colleges and universities in the United States do not do their students the justice to put before them fairly the courses practically every one concedes are desirable for those students to take before undertaking the study of medicine.

The object of this paper is not to bring into discussion the desirability of increasing the minimum requirements, but to point out that the average intelligent undergraduate will probably decide wisely for himself that a broader cultural education is desirable, provided he is fully informed and is properly advised. There will always be the student who will want to get in on minimum preparation, get through with the minimum passing grades and get by after he graduates with the minimum amount of work; but my experience has been that the average student who enters medical school is of the type so consecrated to his work that he wants to do it well and that he is likely to take more

*Read at the Thirty-Seventh Annual Meeting held in Cleveland, Oct. 25 and 26, 1924.

than the minimum preparation and to develop himself into more than just a "passing" man if he is shown the wisdom of better preparation.

Rarely ever will the less educated physician contend that a college degree or its equivalent is not desirable. Nevertheless there are many who hold such preparation is not necessary, although these are usually among those who have not themselves experienced its advantages. An increasing number of medical students are voluntarily taking three or four years of premedical college work. An increasing number of medical schools are demanding more than the minimum preparation. Against this there is a decided reaction on the part of a vociferous medical minority who influence to their point of view a lay majority whose hope naturally is father to their thought that lowered requirements will release more doctors to the country districts, which do need more doctors. It is hoped that anyone who argues this point will first read the proceedings of the Chicago Conference on Medical Education for 1925.

The United States Bureau of Education is authority for the statistics that those with no schooling have one chance of success in 163,000; those with elementary education, one in 40,841; those with high school education, one in 1,606; those with college education, one in 172. In medicine, as in other professions except teaching, politics and the ministry perhaps, are leaders of the highest type needed. A college education will not necessarily make leaders, but it will go far in helping to make them. Else why to-day do the great corporations of this country, which lead the world in progressive methods, maintain highly trained personnel bureaus one of whose chief functions is to "acout" the seniors in our better colleges for material from which to develop their own industrial leaders? And if great industrial corporations do this, is it not the duty of our medical schools to do anything within their power, in order to render the best service to the public they serve, to choose the best of premedical students from whom to develop doctors for that most important leadership which will help people to prevent disease and bring up children with sound minds in sound bodies?

How can this best be done? Heavily endowed, privately owned universities can take, and many have taken, the lead in raising entrance requirements and in putting into force a selective system of admission. In the poorer institutions, however, and in the tax supported institutions, progress in this direction cannot go far ahead of public opinion. Public opinion is the result of education of the public. The people can be trusted to see in time what is best for them in spite of selfishness and demagogery. If it can be demonstrated that doctors who have had more than the minimum preparation make better doctors on the whole for the public and have greater chances for success themselves, then it will be easy to require such increased preparation. How can the wisdom of such procedure be demonstrated? One method is properly to inform premedical students early of the advantages of more than the so-called minimum preparation. The other is to analyze

results and present them to the public. With the first method surely college educators should cooperate. Yet more than half of the catalogs of our approved universities and colleges offer no advice on this important subject. Incidentally, the same holds true of courses preparatory to the other professions.

Practically every university with a school of medicine offers combination courses with baccalaureate degrees (somewhat modified in cases), given after two or three years of premedical work and one year in medicine as a rule, with the medical degree at the end of four years in medicine. Nine give six-year courses only, twenty-six give seven-year courses only, and twenty-two give both. In addition to this approval of condensing premedical and medical education, sixty-three other standard colleges or universities without medical schools give a degree in absentia, counting the satisfactory completion of the first year in medicine as the approximate equivalent of the last year in the baccalaureate course. Of these sixty-one, 18.6 per cent of the 327 institutions studied, only three did not require at least 90 semester hours in college. Counting the combined degree courses in universities with medical schools, and degrees given in absentia by colleges without medical schools, it is possible for a boy to obtain a baccalaureate degree and a medical degree in 57 per cent of approved colleges in the United States in less than eight years. Without discussing the arguments for or against this procedure, it can be said that it is established in very many of the oldest, strongest and some of the most conservative institutions in America; e.g., California, Yale, Illinois, Iowa, Hopkins, Maine, Michigan, Minnesota, Dartmouth, Cornell, Columbia, Hobart College, Union College, Pennsylvania, Vermont, Virginia, College of William and Mary, and all state universities except Arizona, Florida, Louisiana, New Mexico and Washington.

Suppose that 75 per cent, instead of 57 per cent, of standard colleges and universities offered combination courses or baccalaureate degrees in absentia, and suppose that 100 per cent, instead of 57 per cent, advised premedical students to take more than the minimum preparation. Suppose that every college catalog devoted a page or two to recommending in sequence: (1) A four year course; (2) three years with or without combination, as the college thought best; (3) two years with a little more than the minimum preparation. Suppose that, with these three courses, every catalog introduced these choices with a paragraph something like this:

"Every student with ambition for a professional career should study carefully the importance of the broad cultural foundation of a complete college education before entering upon the highly specialized curriculum of a professional school. In no profession is a high type of leadership needed more than in the practice of medicine with its tremendous and ever increasing public and private responsibilities. In preparation for this profession no student, rich or poor, can hardly afford to practice early false economy of time or effort. The investment of a year or two in

youth will return rich rewards ten or twenty years later when competition with better trained men brings embarrassment. Other things being equal, the best prepared man will win. Every prospective medical student is urged to send 10¢ to the office of the Council on Medical Education of the American Medical Association, 535 North Dearborn Street, Chicago, for the pamphlet, 'Choice of a Medical School'. In addition he should study the requirements of the medical schools he may enter, because many require more than the minimum preparation fixed by the Association of American Medical Colleges. He should also consult early with his dean or faculty advisor. In this school the premedical student has the following choices:"

Then should follow in order (1) the outline of regular four year baccalaureate courses leading to the degrees of S. B or A. B., (2) combination courses with baccalaureate degrees in absentia after three years in college and, finally, with the least emphasis and conspicuousness, (3) the minimum legal preparation.

If this matter could be brought to the attention of the authorities of these 327 standard universities and colleges, as well as others from which medical students come, and if the Association of American Medical Colleges and the Council on Medical Education could analyze the results and disseminate them for the education of the public, especially of state legislatures and state boards of licensure, then would be hastened the day when most, if not all, approved medical schools could easily do what a goodly number are already doing, requiring for entrance the college preparation represented by a baccalaureate degree or at least three years in a college which will confer a baccalaureate degree upon its students who successfully complete the first year in medicine in an approved medical school. Everything connected with such a procedure, carefully safeguarded as to standards, elastic enough to be liberal, would work to the advantage of the college, the medical school, the student himself, the public; and last, but most important, the patient.

May we not, on the whole, secure better results by suggesting, advising, showing reason therefor and leading, rather than by fixing and attempting to enforce higher entrance requirements against popular opposition which comes from a disinclination to expend more time and money rather than from actual knowledge of real conditions? In a majority of the universities and colleges, by reason of combination courses and degrees in absentia, this really involves only persuading the student that the one more year than that required for minimum preparation will be worth while, not only for the broader knowledge it represents, but for the stamp of a college graduate which a degree confers.

Finally, it would seem better if college catalogs would say nothing whatever about premedical preparation than barely outline the minimum courses required, because the poor Freshman, just out of high school, is very likely to take for granted what is implied, that sixty

States and Territories (50)	Number Colleges and Uni- versities Studied	Pre- Medical Prepa- ration not Mentioned	Only Minimum Require- ments Outlined or Mentioned	Total Minimum Prepa- ration or No Mention Per Cent	Shortened or Combined Courses				More than Minimum Preparation Recommended Per Cent	
					De- grees in Ab- sen-tia	Combined Courses				Total Short- ened Courses
						6 Yr.	7 Yr.	6 and 7		
Ala.	5	---	---	0	3	1	---	4	100	
Ariz.	1	---	1	100	---	---	---	---	0	
Ark.	1	---	---	0	---	1	---	1	100	
Calif.	5	---	---	0	---	---	---	4	100	
Colo.	4	2	---	0	2	2	---	1	50	
Conn.	3	1	1	66	---	1	---	1	33	
Del.	1	---	---	0	---	---	---	---	100	
Dist. Col.	5	2	---	40	1	1	---	3	60	
Fla.	2	1	---	50	---	---	---	---	50	
Ga.	7	4	---	57	---	---	---	---	43	
Hawaii	1	---	---	0	1	2	---	3	100	
Ida.	3	2	---	66	1	---	---	1	33	
Ill.	17	7	---	47	1	---	---	1	53	
Ind.	12	4	1	41	1	1	2	4	58	
Iowa	16	7	2	55	4	---	1	5	44	
Kan.	9	6	1	77	1	---	1	2	22	
Ky.	5	---	---	0	3	---	1	4	100	
La.	3	---	2	66	---	---	1	1	33	
Me.	4	2	1	75	---	---	---	---	25	
Md.	6	3	1	66	---	1	---	1	33	
Mass.	13	10	---	77	---	1	---	---	23	
Mich.	8	1	1	25	3	---	1	4	75	
Minn.	8	3	1	50	2	---	1	3	50	
Miss.	3	1	---	33	1	---	1	2	66	
Mo.	13	6	1	54	---	2	---	3	46	

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semester hours, with certain specified subjects, is quite sufficient, whereas such preparation will rarely get him admission to half of our medical schools to-day. Indeed, one college catalogue state: "The following two-year course covers the entrance requirements of any Class A medical college." This is absolutely incorrect.

My plea is for college and medical school authorities everywhere to combine in giving the poor freshman a chance to make a right decision. Submit something like the advice and choices of preparation outlined above. Then do not bury it in 300 pages of fine print without a flag flying in the index, "Medicine, preparation for."

"An ounce of prevention is worth a pound of cure."

DISCUSSION

DR. L. S. SCHMITT, University of California Medical School, San Francisco: I should like to refer to the University of California Medical School. From the charts, Dr. Graves infers that nothing has been stated in publications of the University of California concerning the premedical course. While it is true that no stress is made in the Medical School Announcement, a separate pamphlet is published entitled "General Information and Requirements for Admission." This outlines in detail the premedical requirements as well as the medical curriculum. Members of the Faculty who act as advisors to premedical students have these pamphlets at their disposal. This information is published in a separate pamphlet as its distribution varies from that of the usual medical school announcement.

DR. S. P. BROOKS, Baylor College of Medicine, Waco, Texas: I hesitate to raise the question regarding the Baylor College of Medicine. The liberal arts college catalogue of Baylor University does make mention and names the advisors for premedical students and the steps to be taken for combination courses. I can quite see how one would make an error in looking over so many catalogues. I felt somewhat jealous because we are doing our best along some of the lines indicated here this morning.

DR. WILLIAM DARRACH, Columbia University, New York: I should like to ask Dr. Graves if he knows how many of the colleges will give A.B. degree after seven years to a student who completes the first year of medicine in a medical school outside of his own university, even though that university has its own medical school. For instance, Yale will give the A.B. at the end of seven years, provided the student does his medical work in the Yale school, but will not give it if he goes to another medical school. For two years Columbia has been giving it to those who have had three years in Columbia and have their first year in medicine in some other accepted medical school than the one at Columbia. I am wondering if he knows how many other universities are doing that.

DR. WILLIAM PEPPER, University of Pennsylvania, Philadelphia: I want to relate a rather amusing incident I had in connection with these seven year combined courses. Two or three years ago, at the University of Pennsylvania we decided to make our requirements the same, I believe, as those at Cornell and Western Reserve, and possibly some other schools, and only admitted a man with a degree or the promise of a degree through a combined seven year course. We did admit one class with those requirements.

Dickinson College has no medical school of its own, and objected to our requirements on the basis that we were discriminating against their students. We were willing to admit a man who had three years at Pennsylvania State College, they said, but we were not willing to admit a man who had had three years at Dickinson College, because the State would give a degree in absentia and Dickinson would not. I tried to point out to the president of Dickinson College that they were not being discriminated against, but that they were discriminating against Dickinson College, but he could not see it that way. Instead of having a row with a number of the other colleges in Pennsylvania who felt the same as Dickinson, we went back to our former requirement of three years flat without making mention of a degree.

There is a feeling among some of the colleges that they do not approve of a seven year combined course, and I, for a number of years, have been writing to the colleges in Pennsylvania urging them to start such a cooperative scheme but have met with very little success. I want to get from Dr. Graves the list of the colleges without medical schools that are willing to allow their seniors to go to medical schools and take their senior year in absentia and grant them their degree. There is still a good deal of opposition among the smaller colleges of the country to these seven year courses.

We persuaded our college faculty to agree to grant a degree to a man who had three years in our college and who then went to some other medical school than our own. But I do not think as yet that they have done so. There has been some hitch, so we have not been able to use that as an argument in favor of reciprocity.

DR. G. CANBY ROBINSON, Vanderbilt University, Nashville, Tenn.: We have followed the plan of admitting students as seniors in absentia and I believe that this plan has one very definite advantage that has not been emphasized. If the student in college is working toward a degree the college can see to it that the course is rounded out in such a way that it actually leads to a bachelor's degree, even though the fourth, or senior year, is taken in the medical school. If a student is only interested in meeting the entrance requirements of the medical school, and is not working toward a degree, it is not necessary that he take a well rounded college course. That is the reason why we have adopted the plan of admitting our students as seniors in absentia, or only after they have already received their college degree.

DR. GUY L. NOYES, University of Missouri, Columbia: We all hope that the students will take more arts work than the minimum requirement. Our experience at Missouri shows that when properly advised this comes about. For instance, in the class admitted to the medical school in 1925, eighty-two hours of college work was the average amount done by students, not counting those who had the A.B. degree. In 1926, this fall, the average number of hours of arts credit was eighty-five, not counting those who had the A.B. degree. This, we believe, we have brought about by a system of premedical advising that is carried on altogether by the members of the medical faculty. The members of the faculty of arts have been generous in their attitude and have cooperated with us. All premedical advising during the enrollment period is carried on by members of the medical faculty.

DR. WILBURT C. DAVISON, Johns Hopkins University, Baltimore. The medical schools which have been mentioned as requiring four years of collegiate study for admission occasionally accept students who have had only three years provided they have received an academic degree. Candidates from the undergraduate departments of the Johns Hopkins and several other universities can complete their courses in three years and obtain a B.A. or B.S. degree and as far as I know no medical schools discriminate against these men and make them take a fourth year before admission.

DR. STUART GRAVES: I was afraid when I attempted to give a paper of this kind, based on catalogues, that I would be called for some errors. I want to apologize to California and Texas. Some college catalogues are fearful and wonderful creations. The average person out of high school, who looks through some of them in order to get informatin, if he does get that information, is entitled to a degree without going any further.

Answering Dr. Darrach's question, I think that there are not more than a half dozen universities broad enough to give a degree in their colleges when the students go to some other medical school than that in their own organization. I had in mind what Dr. Pepper said, that Pennsylvania was not discriminating against Dickinson students, but that Dickinson was discriminating against its own students.

Dr. Robinson has emphasized the point that I hoped was obvious in the paper; that is, that, under the personal advice and work of medical teachers and medical deans and medical faculty advisors from the college of arts, almost all of the intelligent premedical students will voluntarily do this thing if they can only be shown the advantages of it. I have a little pamphlet that some one might care to make a note of. This is published by the Ohio Wesleyan University at Delaware. It is a fine example of advice which should be given to every premedical student. Under six heads it offers the kind of advice I am making a plea for.

I am not sure that I understand Dr. Davison's question so I will be glad to talk to him about it afterward.

THE STUDENT VS. THE FACULTY

A Psychiatric Appreciation

BEN KARFMAN

Professor of Neuropsychiatry Howard University Medical School

It may seem somewhat irrelevant to bring to your attention a subject, which on the surface at least, appears to have but remote relation to medicine. But I shall attempt to present to you certain college problems toward the solution of which the psychiatrist can make a definite contribution. My experience with this matter on the campus has been too brief to permit of wide generalizations, but some significant situations have already come to the surface. I have learned that there, as elsewhere, many students fail and are sent back home, never, perhaps, to return to school, because in one way or another they have failed to live up to the demands and obligations of the standards imposed. But behind the bare failure, I have often been able, as a psychiatrist, to discover that there were distinct personality disturbances that were caused by a great variety of conditions.

It may have been a bad home situation, to which the boy could not adequately adjust himself, and which distinctly interfered with his progress in school; or it was due to the youth being suddenly thrown on his own resources in a very strange and apparently hostile environment; here was the opposite of being thrown into a whirlpool of social activities which for the time being had so consumed the energy of the newcomer, as to have left little effort for anything else; and too, there is always the large group of young people who have not been able to solve satisfactorily problems relating to their intimate sex life, etc., etc.

We instructors look only at the net results—the failure—and we ourselves do not realize that failure in itself is not a single entity, but covers a wide variety of conditions with an equally wide basis of motivations; that they are the end results of a long series of maladaptations; above all, we fail to realize that the situation is essentially a psychic one, and this being thus fundamentally a psychologic condition, it must be dealt with in a psychologic way. Giving the student a failure and sending him home may help us, perhaps, to get rid of the necessity of handling a difficult situation, but in doing so we have by no means solved the problem nor in any way absolved ourselves of the responsibility for the ill results. It is, in a sense, even a cowardly attitude; it takes no great brain to educate a studious and capable student—he educates himself; but it takes courage and responsibility and intelligence to educate one who for one reason or another is falling behind. Even where we seem to sympathize with the student, we only shake our head and mutter in a low tone—"It is too bad, it is

really a pity; I rather like the boy, but he is such a poor student—I do not see how I can conscientiously pass him," etc., etc. What is needed in such cases is not severity of punishment or sympathy and condolence—but insight into the personality of the individual who has failed, the fundamental background for his failure. Once this is understood and the real basic diagnosis made, the remedy will soon suggest itself. That, of course, requires study, careful painstaking study of each failure—and we have not, as yet, developed full facilities for that,—but how much more gratifying are the results. A sympathetic insight into the nature of the individual difficulties and a timely advice in accordance with the needs of the particular situation, has enabled me on several occasions to tide the student over the problem and save him for the school. If it could be done with a few students, it can be done with all the students that need such help.

There is another point that we do not always bear in mind. We forget that the majority of the students are at the stage of puberty, a stage as trying as it is dangerous. Very few, indeed, pass it with entire success; a number manage superficially to make an acceptable adjustment so far as grades and departments are concerned, but bear scars and wounds that a trained psychiatrist has no difficulty in detecting—it is an adjustment which is often made at the expense of the better part of the personality; some lead a hectic and checkered sort of existence and pay the price by being expelled when a better insight into their life could have saved them from the pitfalls that beset them.

My experience is that the number of students that are expelled from college because of actual lack of ability is very small and that behind the majority of failures is some personality disturbance which can only be corrected by the psychiatrist. More disciplinary measures would not suffice. They have failed before and will fail in the future because these measures do not take into consideration the personal equation. And can we afford to lose students who otherwise give promise of culture and intelligence? The only answer is "No." We need all the leaders and intellectuals we can train. It falls specially within the province of mental hygiene to save the failing youth from pitfalls and missteps incident to it. It is my vision that the future dean of men and women should be a psychiatrist whose function it shall be to guide the youth of the school. But to do that we have to train psychiatrists who obviously can only be recruited from the ranks of the medical profession. It is the duty of the psychiatrist to take care of the mental health of the student in the same way as the physical director at present takes care of the more strictly physical needs.

As educators each one of you, no doubt, sees the importance of your particular subject in the training of students, but it is not always an easy matter to get the student to understand it. If our work is to be productive of the highest results we must create an enthusiasm for

the subject and we have learned that such an enthusiasm cannot be created by force. How, then, to get the most out of the student by having him absorb the essentials of the subject, and yet to keep his good will, is a task that confronts every intelligent instructor.

You will no doubt ask me "Why should an instructor care to keep the good will of the student when regardless of the good will he can make the student absorb the required amount through the more direct technique of examination, grades and other means of influence." I do not presume to be a deep student of human nature, merely because I happen to specialize in a subject that has for its purpose the understanding of human reactions, but I do not think I exaggerate when I say that one of the greatest obstacles in education is the failure to realize that the fundamental basis of relation between instructors and students is essentially a psychologic one, perhaps not like in some respect the one existing between the doctor and the patient.

Since the relation is a psychologic one, it is essential to understand the basis of such relations. To begin with, we must dispense with the old and antiquated idea that the student, be he stupid, average or very gifted, can do equally well in all subjects if he applies to each the same degree of effort. There are very few people who are equally gifted in all directions. Assuming that the student applies himself with equal effort to all studies, he is obviously not going to get equally good results in all. How are we to judge him—on the basis of effort or basis of results? It is usually on the latter basis, since this is fairly concrete and more or less measureable, while effort is a rather indefinite and indeterminate quantity. But it is at this point that I wish to take issue with the great majority of instructors.

I believe the "effort" in itself is not an indifferent psychologic state, but a very dynamic factor which for good or bad, may influence the work of the student. Assuming a particular aptitude and liking for a subject, the student is going to put more effort into that subject and, other things being equal, is likely to do better in it than in other subjects, whatever may be his ability. But even more important than this is the psychologic attitude which the student is going to assume toward the instructor. If he takes a liking to the instructor, he is going to do well, even if the subject itself is not one that would ordinarily attract his interest. This like for an instructor may have to do with the manner of the presentation of the subject, his personality, his attitude toward the student body, etc. On the other hand, if the student takes a dislike to the instructor, even if he likes the subject, he is not going to do well in it, all apparent efforts notwithstanding. This, to my mind, will explain a certain percentage of failures among students. Thus, there is the diligent student who is interested in the subject and therefore doing well; the student who is not interested and therefore doing poorly or at best only meagerly; there is the indifferent student who can be interested in the subject and thereby raise his academic record, and there is finally the student whose in-

terest can not be aroused—he presents a particular educational problem to the solution of which the psychiatrist can contribute his full share.

Well, how about the instructor? Herein, indeed, lies the crux of the problem. We have taken for granted that the instructor is the immutable thing, descended from Heaven with a halo around his head, perfect from head to foot—and it is to this type of superman that the student is supposed to make his adjustment. The student is the soft plastic material, flexible enough to adapt himself to the instructor whosoever and howsoever he may be; and if the student fails to adapt himself—then he is to pay the price. But here, again, I would take issue with the accepted attitude and say that we, the instructors, ought, as a group, to change our attitude toward the student, we ought to become plastic for a while.

Let us individualize the student and when he begins to fall behind, let us not threaten him with hell-fire and brimstone, but attempt, instead, to find out why it is that he fails to get the subject—is it negligence, social diversions, home or personal difficulties, or what. We shall then be amazed at the results. We shall find, as I had the opportunity to find, that by putting a personal touch in our relations, we can literally lift the student from mediocre to even very good standing. It is because of this that I have long adopted the attitude that however good a formal course I may give, I shall never be able to train my students unless I could create an enthusiasm for the subject. To accomplish this, I familiarize myself with my students, make them feel at home with me, and their response, I can say, has been highly gratifying.

Let me finally cite you another instance of the meaning of the relation between teachers and students. I refer now to the matter of students resorting to unfair methods in their dealings with the faculty, more particularly in the classroom examinations. It is a chronic affair, one that is quite universal among students, much as it is to be regretted; it is, one may even say, a part of the curriculum and the necessary training of the student, as matters stand at present. The problem always looms large before us. The means heretofore used by the faculty in dealing with the situation was to punish the guilty party, and by so doing feel as if it had solved the problem. I never could see the justice or correctness of such view. Apparently, this method has failed of its aim, for it is significant, that in spite of its use and the odium which seems to stigmatize the act, this type of activity is as rampant and widespread as it ever was before and there seems to be no relief in sight. The honor system will not do, in fact it merely aggravates the situation, because it does not take into consideration the psychology of the reaction. The only immediate, practicable remedy would seem to be the inauguration of a system of spying and watching over students, which would hardly reflect credit on the college.

Since it is so universal a recreation and is not infrequently utilized

by students who do not in the least need to resort to such methods and whose personal honesty and integrity in every day life, is quite beyond any reproach, it is, perhaps, proper to inquire as to the reasons therefor. What strikes one's attention here is first that whether openly or secretly, directly or implicitly the practice is condoned, even sanctioned by practically the entire student body. In other words, so far as the student is concerned, it has the approval of the social body which forms its main medium and it is safe to say that in the mind of the student the act is not regarded as immoral, wrong or antisocial. It is important to realize this in order not to lose sight of the psychologic aspects of the situation.

Another striking thing, one which, perhaps, is a corollary to the first, is that I have yet to see a student caught at the practice who was truly penitent over his act; rather does one feel that there is merely regret that he was not clever enough to put one over on the prof. When caught, some flatly deny the fact in spite of being confronted by most damaging and incontrovertible evidence, while others admitting it, first offer some kind of justification for the act and then throw themselves at the mercy of the court (the professor) without, however, showing the degree of feeling of guilt which one would expect under such circumstances. Where the student denies most evident guilt, he is obviously resorting to lying to protect his cheating, and one can easily see the demoralizing effect of such a defense; while in the instance of admission of guilt, it leads to humiliation which, too, is not without its demoralizing effect. What we, of the faculty, have so far failed to realize is that the student body, as a whole, is quite a fair and decent group of men and women and that the great majority of them would never have thought of resorting to the practice or condoning it if they had not thought it to be perfectly fair to begin with.

The psychologic fact is that the student body as a whole, feels itself inimical and at war, so to say, with the faculty which it regards as its arch enemy and antagonist. It is a war in every sense of the word, and in a war, you know, all means are fair and just; hence the tacit, but none the less present, sanctioning of cheating by the student body as a means of fortifying its posts and positions. It is a constantly waged battle, a war of wits, to be sure, but a war all the same in which the victor (the professor) asserts his intellectual superiority, while the vanquished (the poor student), beaten but not yet convinced, is obliged to go back to his detestable textbook and once more memorize its dull and uninteresting pages. It must be admitted, however, that on the whole, it is the student who is the victor. And who can describe the genuine feeling of gladness of heart which is of the student when he manages to put something exceptional over on the faculty. The joys of a dreamer in his happiest vision have never equalled this.

Tracing this attitude to its course we shall find that it is not peculiar to college life, but that it has been ingrained in us from our early grammar days, continued and elaborated through high school

and found its clearest expression and perfection in college. The guilty party is our educational system which fails to take into consideration the individual intellectual and emotional equipment of the student and attempts by more or less purely external methods to impart to him a certain modicum of knowledge, or shall we better say, a certain number of facts. In college, looked at from any angle, it is entirely our fault, the fault of the faculty, that we have estranged ourselves from the student and failed to get en rapport with him. Our methods of testing his knowledge are crude to the last, our system of quizzing is archaic, not to say unfair, and we have not as yet learned the very basic fact that the growth of intelligence cannot be measured in terms of so many facts remembered, but only by the widened intellectual horizon that must be measured by standards altogether different; our treatment of him when subjective is often unjust, and when objective lacks the wormth so essential in any set of relations. And yet we expect him to respond with the best there is in him.

It is psychologically impossible. No system of penalizing and no honor system will ever do away with the practice of the student using unfair methods toward his teachers as long as he is being treated as he is now. Let the instructors individualize the student, by attempting to understand something of his inner self, let them personalize their relations with him and infuse into him a genuine enthusiasm for the subject, and there will be no place for cheating, for the psychic stimulus of it will be taken away.

I am sometimes tempted to compare the attitude of the student versus the faculty to that of the criminal versus society, and in some respects the comparison is not an unfair one. Centuries of most severe punishments have failed to eradicate criminality and it is safe to say that a cryptic criminal lurks in most of us; and it is only in recent years that we have begun to appreciate the fact that criminality is not an isolated reaction of an individual, but is an expression of his whole personality, that traced to his earlier years the so-called criminal may be found to have been a perfectly nice and decent child whose activities, however, have unfortunately been misguided and misdirected by the ignorant and unintelligent teacher and parent. And thus, too, is the school boy and the student whom we have so far treated en masse and whose inner personality still remains to us an unknown quantity. It is here that the psychiatrist can render distinct service by establishing a better psychologic rapport between the student and the faculty, by learning something of the ambitions and drives of the individual students and, horrible dictu, giving, perhaps, a little personal insight to some members of the faculty some of whom need very badly to see themselves as others see them.

The import of psychiatry lies not only in its dealing with insanity proper, but as well with those subtler, minute and unrecognizable deviations, which in spite of their minuteness are often responsible for gross failures in life. I have only given you a few instances of the

application of psychiatry to the daily problems of the college community. It would take me far away from the immediate subject to bring before you related problems; suffice to say, that I do not believe there is a problem that any college community might face to which mental hygiene, which is the social expression of psychiatry, cannot contribute its specific message. I believe the time is not far distant when there will be brought into existence a mental hygiene movement which will deal specifically with educational problems as a whole. Such a movement will mobilize and coordinate our educational resources and thus bring to its highest expression the intellectual equipment of the nation. But to accomplish this we need many trained psychiatrists, and it is for this reason, that I, as individual teacher of the subject, have long felt that my function in the school is less to teach formally a medical subject than to train missionaries that will help to spread the good gospel of mental hygiene. Indeed, it would have relieved me of a great deal of trouble, worry and effort if I could see my way clear to be satisfied with merely formal requirements of a course in psychiatry. A course of ten or fifteen lectures, with a few clinical demonstrations, a final examination and grades—and so far as the school is concerned I could have satisfied the requirement for a fairly satisfactory course in psychiatry—as good, perhaps, as there is in the average of the better schools. But ever before me there stands the problem of the many maladaptations to which society is heir and for which it is paying such a heavy price. Mental hygiene can contribute its full measure toward the solution of these problems. Here is a big and ready field, as yet barely touched by other hands and which promises so much.

TIME OF APPOINTMENT OF INTERNS

The following letter from the dean of Columbia University College of Physicians and Surgeons, New York, is self explanatory. It will no doubt be a stimulus to other schools and hospitals to do likewise and thus help to solve what has proven to be a most vexatious matter in the past. Courses have been disrupted by the scramble for hospital positions; the students work has suffered, and hospitals have not profited. Here is the first step to overcome many annoyances.

Dr. Fred C. Zapffe, Executive Secretary,
Association of American Medical Colleges,
3431 Lexington Street, Chicago, Ill.

Dear Dr. Zapffe:

For a number of years attempts have been made to defer the appointment of hospital internes until towards the close of the fourth year. The Association of American Medical Colleges, the Council on Medical Education of the American Medical Association, and the American Hospital Association have all passed resolutions favoring this idea. The difficulty has been in persuading someone to take the lead.

This is to inform you that it has been decided to defer the appointments of internes at the Presbyterian Hospital in the City of New York until some time in April.

It is earnestly hoped that other hospitals and schools will be able to act in a similar manner.

Cordially yours,

Dec. 2, 1926.

WILLIAM DARRACH, M.D., Dean.

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The Thirty-Seventh Annual Meeting

The thirty-seventh annual meeting has passed into the realms of history. It was unanimously proclaimed the best meeting in every way,—program, attendance and interest shown in the proceedings. If memory is correct, the same verdict was rendered last year, and the year before, and the year before that, and so on. Is the quality and character of the program getting better each year—or is the interest of those attending the meeting increasing? However, it is a fact that the attendance is becoming larger; that each year more colleges are represented by one or more delegates. Dare one hope that at a not far distant meeting every college in membership will respond to the roll call?

Out of the total membership of 73 colleges, 67 were represented by delegates, 10 more than at the Charleston meeting in 1925, which was "the best ever" at that time. Quite a number of colleges sent more than one delegate, and a number of universities

were represented by their chief executive or by his personal representative. Evidently, there is an awakening or a growing interest in the activities of this Association on the part of the men who must, perforce, include among their responsibilities the conduct of a medical school. They are most welcome. It is well known that university executives are very busy men; that they are intensely interested in their medical schools; that they would like to attend these meetings, but the demands made on their time are far in excess of their ability to comply; yet by sending a personal representative, an early direct report on the occurrences at the meeting is assured, and the other delegates are stimulated.

The attendance was an unusually large one, and in this computation the Cleveland delegation is not included. It was greater than at any previous meeting. And, what was particularly noticeable was the fact that having entered the meeting room, the time of leaving it was synchronous with the end of the session. There was not that annoying and disturbing entering and leaving which is so often seen at meetings. The program must have been a good one,—and it was. Many interesting and informative papers were read, and the discussion was more free than usual. It would be a task impossible of performance to select a "best" paper. All the papers were good, especially the statistical studies presented by Drs. Wycoff, Weiskotten, Tracy and Myers. Similar studies have never been made before. Some of them involved a considerable financial expenditure, as well as time and labor. But for the financial assistance given by the Commission on Medical Education, which has a very great interest in these problems, this work could not have been carried to conclusion or even undertaken on so large a scale. For this financial help the Association is very grateful.

Those who were not present at the meeting, missed much. The stimulus coming from contact with others engaged in the same sort of work cannot be overestimated, nor can a correct estimate be made of the value of the work that is being done by this Association except by coming to these annual meetings. The Association is doing things, big things, in medical education and medical pedagogy. Its good influence in these fields is becoming more and more apparent and felt.

The 1927 meeting will be held in Montreal, October 24 and 25. Can there be any question that it will be the best meeting ever held? Not with our Canadian friends and co-workers making the arrangements.

Mark your calendar now and make your arrangements to be present at that meeting, the first to be held outside of the geographic borders of the United States. Fortunately education does not recognize borders, lines or other geographical or political limitations.

New Officers

The following were elected to office at the annual meeting: President, Charles F. Martin, dean Faculty of Medicine McGill University, Montreal; vice president, Guy L. Noyes, dean School of Medicine University of Missouri, Columbia, Mo.; secretary-treasurer, Fred C. Zapffe, 25 East Washington Street, Chicago. To the Executive Council for two years, Charles P. Emerson, Indiana University School of Medicine, and Ray Lyman Wilbur, president Stanford University, California.

Dr. Walter L. Niles, dean Cornell University Medical College, First Avenue and Twenty-Eighth Streets, New York, was elected chairman of the Executive Council, and the following Committee on Medical Education and Pedagogics was appointed:

Alexander S. Begg, Boston University School of Medicine, chairman; Livingston Farrand, Cornell University, Ithaca, N. Y.; Burton D. Myers, Indiana University School of Medicine, Bloomington; E. S. Ryerson, Faculty of Medicine Toronto University and McKim Marriott, Washington University, St. Louis.

The Bulletin

On the recommendation of the Executive Council, the Association decided to discontinue the publication of a separate volume of Proceedings and to incorporate it in the BULLETIN, thus increasing the size of this publication very considerably. All of the proceedings of the annual meeting will be published in one annual volume of the BULLETIN and binding these four issues will constitute a volume of proceedings plus much other useful and valuable information.

It was further decided that not more than twenty-five (25) copies of any issue of the BULLETIN be sent to each college in membership in the Association, that the college furnish the secretary with the names of the recipients so that they may be placed on the mailing list. In this way only can assurance of delivery be had.

And, it was also decided that all others must pay the regular subscription price of \$2.00 per year for the BULLETIN, and that the scope of the BULLETIN be further enlarged by initiating an advertising feature for medical text books and teaching paraphernalia and accessories and whatever else will have informative value for medical teachers.

The colleges are urged to appoint some one who will transmit news to the BULLETIN. Anything that concerns the college is news: changes in faculty, educational experiments, data on students, new buildings, new equipment of any considerable

amount, endowments or receipt of other gifts. The BULLETIN should be the place, the one place, where all college news may be found and the news will be authentic if furnished by the college.

Faculty members are again urged to send in original contributions on any subject related to medical education and medical teaching. This is the BULLETIN of all the faculty members of all the medical colleges in membership in the Association, just as this is their Association and not an association of deans or college executives or administrators. Therefore, all share in the responsibility of making a success of its affairs and activities. However, it may be pointed out in passing, that only the dean, or his official representative, has a vote in the executive session.

New Members

The Dartmouth Medical College, Hanover, N. H., was elected to membership. This institution was one of the charter members of the Association in 1891 and was also in membership in the first American Association of Medical Colleges which was organized in 1873 and became extinct in 1883 or thereabouts.

The Graduate School of the University of Minnesota, including the Mayo Foundation, was also elected to membership. The membership of the Association now numbers 75; one member is a post graduate school and another is a graduate school. Eleven members are two-year schools. Three Canadian medical schools are in membership.

Medical Education In China

In China the standards for medical education are determined by the Council on Medical Education of the China Medical Association. A premedical syllabus was adopted in 1920. It was

prepared by a committee of six pre-medical teachers and contains concrete suggestions for two years work in biology, chemistry and physics. The standard premedical course consists of a minimum of two years of college grade work with a minimum of 44 credit hours to be devoted to biology, 12 credit hours, chemistry, 20 credit hours, physics, 12 credit hours, a credit hour being the equivalent of one hour of lecture work per week per semester. Three hours of laboratory work are regarded as being equal to one hour of lecture work. A minimum of one year of laboratory science in the senior high school is required for entrance to the college course, and provision must be made for cultural subjects in the premedical curriculum.

The nature of the work to be done in the specified sciences is also prescribed both as to time and content of courses. For instance, the time in biology is equally divided into three courses, namely: general biology, invertebrate and vertebrate zoology. Text and reference books are suggested, a scheme of division in point of time for lecture and laboratory work, and suggestive outlines of courses, with a statement as to the aims of each course, are given.

The prescription in chemistry includes general chemistry, with qualitative and quantitative analysis, elementary physical chemistry, and organic chemistry. The course in physics embraces only general physics.

The requirements for recognition of medical schools by the council of the Association are: the course must be of at least five years duration. The last year may be devoted entirely to clinical or laboratory work. The total number of hours for the first four years of the course are 3,600, divided equally between the preclinical and clinical subjects. At least 150 hospital beds and one dispensary must be under the control of the school.

Each student is required to be present at no less than six maternity cases and twelve necropsies. A working medical library, receiving at least twenty-five medical periodicals, a medical museum, facilities for experimental laboratory work and auxiliary apparatus are specific requirements.

Each annual course shall consist of not less than 32 weeks, in four calendar years. The time of the fifth year is not included in this reckoning. The time allotted to the various subjects in the curriculum is virtually the same as that set forth in the medical curriculum adopted by this Association. However, a specific number of hours and not percentages, a minimum and a maximum, are given. Physiology is grouped with physiological chemistry. No mention is made of time to be devoted to teaching preventive medicine, hygiene and sanitation and public health.

The Approach to Medicine— Biology or Chemistry?

It is the common observation of the teacher that a student entering the medical school has given more attention to the biological group of sciences than to the physics—chemistry class, or vice versa. Much the same preference is shown by students in general, for one who has especial aptitude for the humanities, like history or language, seldom exhibits a profound interest in mathematics or in analytical studies involving quantity. We may divide all students into two classes, qualitative and quantitative, and not depart far from strict truth.

At the present time, biology is taught to the premedical student as a qualitative, descriptive discipline. This assertion is not meant to imply unfavorable criticism of biology nor of its teaching. Modern biology tends more and more to become a quantitative, critical, analytical subject, actually a branch of physico-chemistry.

However, we must not permit ourselves to be illusioned; as class-presentation, biology remains descriptive and qualitative as far as classes in premedical work are involved.

Not so, however, with chemistry. If one is inclined to question the statement that the method of presentation of these two sciences is different, one qualitative, the other quantitative, he has but to enter the departments in a well recognized institution, or to examine two modern texts, say the recent *Biology of Scott* and the *Chemistry of Deming*. At the end of the first chapter of the *Chemistry* a series of quantitative questions are asked of the student. The pages of the *Biology* are distinctly descriptive.

It is a well recognized experience that a student who enters the medical course in biochemistry, who has come up as a biology man has more difficulty than one trained in the physico-chemical branches. This is to be expected; the content of the premedical work is similar to the course in biochemistry. However, this is not the whole story. The specialist in biology lacks that attitude towards quantity and numbers absolutely necessary for success in a quantitative field.

Now medicine of the present day is distinctly quantitative. Has this man appendicitis? What is the number of his white blood corpuscles? Has this man diabetes mellitus? What is the amount of sugar in his blood per unit? This patient may be nephritic. What is the amount of nitrogen in his blood per unit? The temperature of this patient is 38°C; have you read accurately? Turning to therapeutics, would you give in this case of drowning 1/120 grain of atropine or 1/20 grain? How much, quantity, how many—these questions make up the work-a-day world of the physician. He is ignorant, indeed, who would attempt to maintain the thesis that medicine is not quantitative.

Granting the point, what of the premedical training? Shall the emphasis be biology, which is qualitative, or physico-chemistry, which is quantitative? Stockard says biology: he is thinking of the value of the theory of biology, the use of comparative anatomy and the application of embryology in medicine. The earlier years of the writer were biological; it is for this reason that he feels some qualification for discussing the question. He willingly agrees that anatomy without comparative anatomy is largely rule-of-thumb; that without the theory of biology, the physician lacks a foundation; that dissection leads to the trained mind, the skilled hand. We may say for biology *In tuo lumine, lumen videbimus*.

When the writer says chemistry, he is thinking of the problems that confront the physician where memory cannot serve. The manner in which the mind works, then, will decide the issue. A mind trained to recognize nice distinctions in quantity; a mind, as of a surgeon who suspends his operation until the amount of acidosis is reported, is the *sine qua non* of the successful, latter-day man of medicine. The surgeon trained in the exactness of physics and chemistry will prefer the preliminary information of the test tube to that of the knife. Without the spirit of Pasteur, a chemist, the surgeon would be back where Ambrose Paré was at the siege of Metz as depicted in the painting at the Sorbonne. Without the chemical instinct, medicine would be where the writer's father was during the Civil War, with his massive doses of impotent drugs and his "shot-gun" prescriptions and empirical practice.

In the Book of Knowledge (Liber Sapientiae) we read these words, applicable to modern medicine:

Omnia mensura et numero et pondere disponuisti, which, interpreted, is: "Thou hast ordered all

things in measure, and number and weight."

WITHROW MORSE.

The Interne Problem

For a number of years the American Hospital Association has received reports from its Committee on Interns without taking any action except to continue the committee. At the 1926 meeting of the Association the final report of the committee was adopted. This Association was interested in that phase of the work which dealt with the time of selection of interns and at the request of the representative from this Association to the A. H. A. the committee included in its report and final recommendations a paragraph touching on this matter. Of course, it is presented as a request, and inasmuch as the action of the A. H. A. is in no way binding so far as the action of individual hospitals is concerned, there is manifested a spirit of cooperation between the A. H. A. and this Association which is most commendable. Perhaps hospitals will eventually regard the recommendation as one that might well be acted on definitely, thus helping both the student and the college by preserving the effectiveness of the senior curriculum which has been seriously disarranged by the scramble for hospital positions on the part of the prospective graduate.

The following is a summary of the recommendations of the committee.

1. That the "schedule of essentials" in a hospital approved for interns as prepared by the Council on Medical Education and Hospitals of the American Medical Association be accepted as a standard by hospital and medical schools.
2. That the Trustees of the American Hospital Association consider the advisability of making application for representation in the Council on Medi-

cal Education and Hospitals of the American Medical Association and take such action as they may determine.

3. That the American Hospital Association request adherence of its members to the relationship between hospital and intern as set forth in the "schedule of essentials" in hospitals approved for intern service, and that it collect information regarding the non-adherence of hospitals to this schedule and instances of repudiation of agreements by interns and that it publish such portions of this information as may be desirable or furnish this information to other organizations, such as the American Medical Association, the American College of Surgeons, and the Association of American Medical Colleges.

4. That the American Hospital Association collect and supply to medical schools data relating to the intern service in various hospitals, and to hospitals similar data regarding graduating students in medical schools.

That the American Hospital Association request its members not to appoint interns or to hold examinations for interns until the student has completed three and one-half years of medical study; preferably between March 15th and April 1st.

That individual arrangement be allowed hospitals as to the mode of selection of interns—by certification from medical schools, by appointment on recommendation without examination. While recognizing the inherent difficulties we still recommend wherever possible, that the hospital inspect the candidate and the candidate inspect the hospital.

5. That the American Hospital Association establish an Advisory Committee on Interns, this Committee, upon request, to advise and assist hospitals in selecting that type of intern organization best suited to their needs.

6. The establishment of the following types of hospital internships and residencies from which hospitals may select.

First: Rotating internships of one year, with service in medicine and surgery—medicine to include pediatrics and laboratory work and surgery to include obstetrics; this minimum may be lengthened to eighteen months or two years provided it is warranted by increased educational values. Such rotating internships to be supplemented by residencies of one year or more for graduate interns. These are essential for the proper care of patients and to provide opportunities for those who wish to obtain further proficiency before entering practice.

Second: Non-rotating internships in certain hospitals with highly organized resident systems with continuous intern service in one department of medicine. If of one year duration and the work is limited to medicine or surgery, the intern should be encouraged to complete both services. If longer, they should be so modified as to include some training in other departments. The combination of a short general training in one department offers a very desirable form of internship.

Third: Residencies or special internships in special hospitals, such as eye, ear, nose, and throat, orthopedic, obstetrical, children's, mental, tuberculosis, to be taken only by interns who have completed the minimum intern year. Residencies should also be offered in general hospitals for further training in the major departments, as noted above, to supplement internships in such hospitals.

Fourth: That there be established residencies in suitable hospitals not approved for intern training, to be filled by graduate interns, that these hospitals may have the bene-

fits to be derived from a resident physician and that graduate interns may have wider opportunities for further training before undertaking independent practice.

School of Medicine of the Royal Colleges.

Edinburgh, Nov. 16, 1926.

To the Editor of the *Bulletin of the Association of American Medical Colleges*.

Sir:

My attention has been called to an interesting article by Dr. J. Jay Keegan entitled "An Out-Call Service for Senior Medical Students" in which he describes a system of attendance at their own homes on the poor by senior students of Medicine as part of the medical curriculum in the University of Nebraska College of Medicine. This has been in operation here for thirteen years.

In Edinburgh this system has been a compulsory part of the medical curriculum since 1833, i.e., for ninety-three years. Edinburgh has undoubtedly the claim for priority in this item of medical education, because so long ago as 1776 it established the first outdoor dispensary in the New Town Dispensary, followed in 1815 by the Royal Dispensary, in 1875 by the Western, and later still by the Cowgate and the Provident Dispensaries. These five main Dispensaries serve the whole of the poorer districts in Edinburgh free of charge for attendance, a nominal charge of 2d for medicines being usually made, although in certain cases even this small sum is remitted.

Every week day there is held a clinique at each dispensary attended by ambulant patients, and the cases seen there are followed up at their homes by senior students. Outdoor calls are received at all hours of the day, and these are handed to the senior students for their personal attendance at the homes of the patients. The students attend, examine, diagnose, and prescribe; and go on attending till the patient is well. Those cases who cannot be properly attended at home are transferred to hospitals, as, needless to say, are also all infectious cases. Where the student requires assistance, he applies to the member of the medical staff under whom he is working and the case is visited by physician and student together. In all cases the student reports to the physician on duty on his next periodic visit to the dispensary. Medicines are provided for the outdoor cases in the same manner as for the cases attending the clinic.

This system as been found to be of the utmost value to students, in providing them with experience as to the minor ailments met with in actual practice, and it affords to students an object lesson in the details of the working of an actual practice, while the confidence they obtain in dealing with cases in this manner before graduation is of the utmost possible practical value.

Edinburgh is glad that Nebraska has discovered on her own account this special training as of value for her students. Verily, there is nothing new under the sun.

(Signed)

John Orr,
Dean of the School.

College News

Jefferson Medical College.

The Corinna Bordeen Keen Research fellowship for the ensuing year was awarded to Dr. Aaron Capper, who will devote his time to research in clinical pediatrics.

Dr. Edward L. Bauer, Philadelphia, has been appointed professor of diseases of children to succeed Dr. Edwin E. Graham, resigned.

Marquette University.

Dr. Louis F. Jermain, for fourteen years dean of the School of Medicine, has resigned. The Board of Trustees, in accepting the resignation, elected Dr. Jermain dean emeritus. Dr. Eben J. Carey has been appointed acting dean.

National Board of Examiners Loan Fund to Help Candidates.

The Board announces that a revolving loan fund has been established through the generosity of one of the philanthropic foundations; worthy candidates before the board may borrow approximately one half of the entire cost of the series of examinations, making it possible for those who use the fund to take the examinations at a total expenditure of about \$35 as compared with the present total of \$80. Loans will be made for one year without interest, and may be extended, if necessary, for another two years with interest at 6 per cent. Applications for loans should be made prior to taking the examination in Part III to the secretary, Dr. John S. Rodman, 1600 Walnut Street, Philadelphia.

Boston University.

Dr. William R. Morrison has been

appointed assistant professor of surgery at the Boston University Medical School, Boston. Dr. Morrison formerly was a teacher of anatomy at the Harvard Medical School and the Tufts College Medical School.

University of Manitoba.

Dr. Brandur J. Brandson has been appointed professor and head of the department of surgery at the University of Manitoba Faculty of Medicine, Winnipeg, to succeed Dr. Jasper Halpenny, who resigned on account of ill health; Dr. Daniel S. MacKay has become head of the department of gynecology following the retirement of Dr. Robert M. Simpson; Dr. Tudor J. Jones, Glasgow, has been appointed assistant professor of anatomy, and Dr. Joseph Jackson, formerly of the University of Alberta, has been appointed a lecturer in anatomy.

University of Texas Medical College.

Dr. Henry C. Hartman assumed the duties of dean of the University of Texas School of Medicine, Galveston, at the opening of the fall term. Dr. Charles T. Stone has taken up the duties of professor of medicine. Dr. Titus H. Harris will be in charge of the new department of mental and nervous diseases. Dr. John K. Glen becomes professor of anatomy; Meyer Bodansky, Ph.D., associate professor of biologic chemistry; Dr. Archie L. Mitchell, instructor in diseases of children, and Dr. Paul Brindley, adjunct professor of pathology.

University of Chicago.

The University of Chicago has received a gift of \$3,385,000 from the General Education Board for the support of a medical project at the university which will provide hospital and clinic as well as facilities for research on a large scale in close prox-

imity to the established scientific departments of the university. The gift is conditional on the raising by the university of an additional \$2,000,000 for endowment of its medical program. There will be opened soon new medical buildings covering two blocks on the Midway between Ellis Avenue and Cottage Grove Avenue, where there will be established clinical departments which are to function in the graduate school of medicine, thus making the medical science a definite and integral part of the university and linking them with the present medical sciences, which have been highly developed in the university laboratories. The buildings nearing completion will provide research laboratories for investigation of medical and surgical problems and include new laboratories for physiology, physiologic chemistry, pharmacology, medicine, surgery, pathology, the Max Epstein Clinic and the Albert Merritt Billings Hospital. An integral part of the program will be the work of the Douglas Smith Foundation for Medical Research.

One million dollars was given by Douglas Smith for medical research.

Woman's Medical College.

The Woman's Medical College of Pennsylvania, which is now at Twenty-First Street and College Avenue, has taken title to a new site of about 9½ acres at Thirty-Third Street and Abbotsford Avenue on the outskirts of Germantown. This, it is reported, will eventually be the site of a new medical college.

Northwestern University Medical School.

Dr. Arthur H. Curtis has been appointed head of the department of gynecology to succeed Dr. Thomas J. Watkins who died in 1925.

American Association for Medical Progress.

It is reported by *The Journal* of the American Medical Association that this Association has made a survey of nearly all medical colleges and research institutions in the United States with regard to the inspection by responsible visitors and the care of laboratory animals. It was found that responsible visitors are welcome at all times at these institutions. Some laboratory directors extend special invitations to officers of humane societies in order that they may observe the conditions under which animals are used for experimental purposes. All of these institutions have adopted a set of rules governing the use and care of animals, which provides, among other things required, that operations be approved by the laboratory director who alone can make exceptions to the use of anesthetics, and then only when anaesthesia would defeat the object of the experiment. Attached to the report of this survey is the set of rules observed by medical schools and research institutions. They require humane treatment of animals, and the return of vagrant animals to their homes when claimed and identified.

Dalhousie University.

At Dalhousie University the clinical teaching in minor and many of the chronic ailments is done in the outpatient clinics of the University Health Center. The endeavor is made to send the student to the homes of the outpatients to study, if need be with the assistance of a nurse who has had training in social service, the home conditions of such patients.

Dr. Albert G. Nicholls, for about twelve years professor of pathology and bacteriology, Dalhousie University, Halifax, and pathologist to the Province of Nova Scotia and director

of provincial public health laboratories, recently resigned these positions. Dr. Nicholls formerly was assistant professor of pathology at McGill University Faculty of Medicine, Montreal, associated with the late Prof. John G. Adami.

Columbia University College of Physicians and Surgeons.

Among the new professors in the school of medicine are Dr. Benjamin P. Watson of the University of Edinburgh, who became head of the department of obstetrics and gynecology, and Dr. Joseph G. Hopkins, who becomes head of the department of dermatology.

Tulane University of Louisiana School of Medicine.

Dr. Wiley R. Buffington, New Orleans, has been chosen to fill the place made vacant by the death of Dr. Marcus Feingold, who was professor of ophthalmology.

Dr. Ralph W. Mendelson has been appointed assistant professor of tropical medicine.

Henry Laurens, Ph.D., for the last several years associate professor of physiology at Yale University, New Haven, has assumed his duties as professor of physiology at Tulane. Dr. Herbert Moffett Vann, formerly of Wake Forest College School of Medicine, has taken up his duties as assistant of anatomy.

A Surplus of Physicians in Argentina.

A report from Buenos Aires discloses that the number of medical students in Argentina has more than doubled in the last decade, rising from 3,695 in 1915 to 8,137 in 1924. The population has increased only from 8,000,000 to 9,600,000 during the same period. About 60 per cent of college graduates choose a medical career and

in spite of the entrance examinations, which discard from 40 to 60 per cent of applicants, there are in Argentina half as many medical students as in the United States. The useless expenditure of money, loss of time, purposelessness and disappointment caused by a great number failing to finish the course might be avoided by better organization. Incidentally, the large number of students prevents their getting the necessary practical training. The consequences of excessive output become increasingly serious, according to report. At Buenos Aires there is a physician for every 750 inhabitants. As many are not able to secure an adequate practice, they seek either government posts or teachers' positions. In order to obtain a medical degree, an applicant must devote at least seventeen years to study, and spend in his six years' course in medicine proper about 14,800 pesos (about \$6,040).

Faculty Hospital Proposed in Cincinnati.

The city council of Cincinnati has approved the sale of about three acres of land belonging to the Cincinnati General hospital for a consideration of \$10,000, to be used, it is reported, as a site for a forty bed hospital for the members of the faculty of the University of Cincinnati College of Medicine. An ordinance permitting the construction of the building will soon be submitted to the city council and will no doubt pass.

University of Tennessee.

The University of Tennessee College of Medicine opened its sixty-seventh session, September 27, with 128 applicants for the freshman class, sixty-eight sophomores, fifty-five juniors and forty-seven seniors. The new anatomy building was ready for use. Dr. James M. Skinner, Jr., has been appointed instructor in surgery; Dr.

Morton J. Tendler, instructor in medicine, and Dr. James W. McElroy, instructor in pathology.

University of Louisville.

The University of Louisville School of Medicine opened its fall term, September 13, with the largest enrollment of recent years, sixty-six seniors, seventy-three juniors, fifty-seven sophomores and ninety freshmen. The university has endeavored to provide extra facilities for the maximum enrollment in order to provide as many physicians as possible. To this end the freshman quota has been increased from seventy-five to ninety, and the upper class quotas to about seventy each. The number of applicants has been more than twice as numerous as new matriculants. Of the freshmen, 65 per cent have come from Kentucky.

Johns Hopkins University Medical Department.

There were nearly 400 applicants for entrance to the freshman class of Johns Hopkins University Medical School this fall, and of them seventy-two were adjudged competent to be admitted to the school. The student body comprises a total of 227 students, representing forty-three states and three foreign countries, and among them are thirty-two women.

University of Missouri Raises Requirements for Admission to Medical Courses.

The board of curators of the University of Missouri approved a recommendation of the faculty of medicine fixing the requirement for admission to the medical school at three years of arts work with the same specific subject requirements as now exist. The change becomes effective in the fall of 1928. Candidates for the A.B. degree in the combined course of arts and medicine will receive the degree on completion of the first year of the medical curriculum following the

completion of three years of arts work. The school will continue to offer the degree of bachelor of science in medicine to those who complete the two year curriculum under the present provisions.

Dr. William H. Welch Accepts Chair of History of Medicine at Johns Hopkins University.

Dr. William H. Welch, since 1916 director of the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, has resigned that position, it is reported, to accept a professorship in the history of medicine at Johns Hopkins. This is said to be the first full-time chair of its kind in this country, and was made possible by a grant of \$200,000 from the General Education Board of the Rockefeller Foundation, New York.

Medical Registration in Great Britain.

The Journal of the American Medical Association reports that graduates in medicine of the schools mentioned below are admissible to the final examination by the examining board in England. Evidence by certificates must be produced showing that:

1. A degree in arts has been obtained from a recognized institution, a recognized preliminary examination in general education has been passed, or that some other test of general education, satisfactory to the board, has been fulfilled.

2. The curriculum of professional study has extended over a period of five winter and five summer sessions. (It is not sufficient to produce a calendar of the university showing the course of professional study, but certificates showing attendance on the various courses during the five winter and five summer sessions should be produced).

3. The required examinations have been passed, and the degree of medicine of the university obtained.

4. The age of 21 years has been attained.

5. A certificate of proficiency in vaccination has been obtained from one of the government teachers in the United Kingdom, a list of whom can be obtained on application. (This requirement necessitates an attendance before a government teacher especially appointed for the purpose, for an examination on the subject of vaccination).

The fees for the examination are 20 guineas (\$100), but a further sum of 20 guineas is payable after the examination is completed before the diplomas are granted. The complete list furnished by the examining board in England gives the schools recognized in other countries. Those in the United States are Albany Medical College; University of Michigan Medical School; Emory University School of Medicine, Atlanta; Johns Hopkins University Medical Department; University of Maryland School of Medicine and College of Physicians and Surgeons; Medical School of Harvard University; Long Island College Hospital; University of Buffalo Department of Medicine; University of Vermont College of Medicine; Medical College of the State of South Carolina; University of Virginia Department of Medicine; Rush Medical College (University of Chicago); Northwestern University Medical School; University of Illinois College of Medicine; University of Cincinnati College of Medicine; Western Reserve University School of Medicine; Ohio State University College of Medicine; Detroit College of Medicine and Surgery; University of North Dakota School of Medicine; State University of Iowa College of Medicine; University of Kansas School of Medicine; College of Medical Evangelists; the University of Louisville Medical Department; University of Minnesota Medical School; University of Alabama School of Medicine; Yale University School of Medicine; Tulane

University of Louisiana School of Medicine; the University and Bellevue Hospital Medical College; the College of Physicians and Surgeons (Columbia University); Cornell University Medical College; Creighton University; University of Nebraska College of Medicine; the University of Pennsylvania School of Medicine; Jefferson Medical College; Women's Medical College of Pennsylvania; University of Pittsburgh School of Medicine; Washington University Medical School; St. Louis University School of Medicine; Leland Stanford Junior University School of Medicine; University of California Medical School; Syracuse University College of Medicine; the University of Texas Department of Medicine; George Washington University Medical School; Howard University School of Medicine; Georgetown University School of Medicine.

The Nobel prize for medicine has been awarded to Johannes Fibiger of the University of Copenhagen for his work on cancer.

Professor F. Wood Jones, of Adelaide, Australia, will go to Hawaii to study racial problems in the islands on his research appointment from the Rockefeller Foundation.

Dr. S. D. Wicksell of the University of Lund, Sweden, will be in residence as a special lecturer at the University of Michigan during the semester beginning February, 1927.

Dr. Robert G. Reese, professor of ophthalmology on the Cornell University Medical College faculty, died in October, 1926.

Dr. John W. Broadnax, associate professor of anatomy in the faculty of the University of Virginia Medical School, died recently.

In the October issue of the *BULLETIN* the establishment of the Lincoln and Lee University in Kansas City, Mo., by the Methodist Episcopal church was announced. It is now reported that the alumni of the former University Medical College of Kansas City have agreed to raise \$150,000 of the \$500,000 fund to establish the medical unit for this projected university. It is also reported that some of the best known medical men of Kansas City are heartily in favor of this project and are giving to it their active support.

Abstracts From Current Literature

Teaching on Fractures

I do not think that the subject of fractures is given the place in the curriculum of our undergraduate schools that its importance deserves. The recent graduates know too much about the operative treatment and not enough about the pathology, the repair and the principles which should underlie the treatment. The subject is too often taught by the exhibition of a few cases and the performance of operations for the correction of deformity or the restoration of function—deformity and loss of function which in many instances should never have occurred. Gibbon, John H.—*Surg., Gyn & Obstet.* 43:276 (Sept.) 1926.

Place of Anatomy in Medicine

Why is it that in so many of us the zeal and enthusiasm with which we entered the dissecting room fade so soon and the anatomical "Maconachie" of our dreams is dead before the morning dawns? The art of dissection is laborious; the accounts giv-

en in textbooks are accurate, detailed, and prolix, but as dead as the parts described. Very soon, unless a teacher is at hand, the youthful student of anatomy becomes submerged in a chaos of fact. Some of the best minds which enter the profession of medicine turn from anatomy with contempt; for then it is but a catalogue of names. Besides, the student who would realize his early ideal and the teacher who would willingly help him, have to keep an eye on examination papers. In every question the candidate is desired to "describe" or "enumerate" or "give an account of" shapes, relationships, and attachments of certain structures. All references to the purposes these structures serve in the living body are excluded. The student, in such circumstances, abandons his earlier and truer ideal and accepts the conditions which tradition has made for him. British teachers of human anatomy have realized more fully than those of any other country what is wrong with their subject. Their subject has been killed by tradition, and if it is to take its place as the fundamental subject of medicine, they have to make it alive again. They are now revivifying it in many ways—by using living models as the subjects of their demonstrations and lectures, and by applying the discovery of Roentgen to the study of the living body. They desire that their students should carry from the dissecting room, not a memory of dead subjects, but of live men and women. No matter how high the ideals of the professor may be or how actively the demonstrator may supervise dissections, if this air is to be attained—if the dead subject is to be made alive—each student has to do it for himself or herself. No one can perform this miracle for them. It is an easy matter to reflect skin, separate parts, and give a neat and clean demonstration of structures; to memorize descriptions is, at most, only a mechanical art, but

to build up a living picture of each part as it is dissected, to ask and answer the question, What is the use of this structure? Why is it shaped so? entails real mental labor. Without this travail of the mind the labors of the dissector are thrown away and his time is largely wasted. It is this latter aspect of his work in the dissecting room which the modern student of anatomy fails to appreciate, and towards which his best books give him so little guidance. He clings to the hope that there is some easier way—some short cut—some system of economics which will resolve his difficulties and assist him to satisfy the demands of his examiners. A renaissance is on foot in human anatomy. For the good of medicine and the right progress of their own subject teachers of anatomy are no longer content to confine their efforts to mere description. They feel that the man who describes the anatomy of the brain and central nervous system must also, if labor is to be saved and time economized, deal with the mode in which its several parts perform their functions. Who could describe the human heart intelligently unless he explains its use as a pump? Any account of the lungs, thorax and respiratory passage is useless if the mechanism of the act of breathing is omitted. Sooner or later—and the sooner the better if the student is to be served—a new dividing line has to be drawn between the departments of anatomy and physiology, and that dividing line should not separate structure from function. A knowledge of how this body is made and how it works must provide the basis for all the more practical subjects of medicine. The beginner has to face the fact that to attain such a knowledge requires regular and unremitting application. Application, however, is not enough to attain success; toil soon degenerates into sheer drudgery unless interest is stimulated and maintained. How is this interest to

be maintained? There are many ways. One of the best is to acquire the habit of reading medical journals; never a week passes but there are reported clinical and other cases which have a bearing on anatomy, and in this way students come in touch with the latest application of their subject to medicine. Besides, this habit of keeping in touch with medical literature is one worth acquiring for its own sake; it will stand students in good stead when they have become busy practitioners or have joined the ranks of consultants or of specialists. Another way of maintaining interest in anatomy is to make occasional visits to the operating theatre, to outpatients, or to the roentgen-ray department. A visit to the postmortem room will often give a practical bearing to what the student may have observed in the dissecting room. A glimpse now and then at the pages of *Proceedings* and other publications issued by anatomists and physiologists will place him in touch with subjects which are interesting his teachers and reveal the lines along which new fields of research are being opened up. At least a pastime of this kind will remove from the student's mind a delusion widely held by the public at large—that all worth while knowing about the human body has been discovered long ago. There are many books on medical biography which will well repay study and help to maintain interest in anatomy and physiology, especially the lives of Harvey, Hunter, and Marshall Hall. Every student should get to know John Hilton's book on Rest and Pain, not only for what he has to say, but also for the way he says it. Then there are a number of excellent modern books which deal with the evolution of the human body, and explain the history of its many curious structures. By such diversions the student will relieve the monotony of the more routine studies required of him by teachers and examiners, and qualify him-

self, not only for the work of life, but to take a wide and permanent interest in the welfare of his profession.—Keith, Arthur: *Brit M. J.* 2: 409 (Sept. 4) 1926.

Correlation Between Clinical and Laboratory Subjects

We can sum up the deficiencies of our preclinical teaching by saying that the laboratory branches are taught from a scientific or an academic point of view. The result is that as starches must be converted by the digestive processes before they can be utilized in the body economy, so knowledge acquired from a scientific or academic viewpoint must be converted into knowledge from a clinical viewpoint before it can be utilized in the process of practical medical education. The clinical teacher must do this in the two clinical years. In doing so it is often necessary almost to reteach the subject matter of the preclinical years, using as a foundation the isolated concepts the student has carried with him. The solution of the problem lies in teaching the laboratory subjects from a clinical point of view. We choose the clinical viewpoint because the ultimate use of the knowledge is to be clinical. The objective, the goal, must ever be kept in sight. It is to care for the human being. Against any such revision of preclinical teaching will probably come the objection that there is insufficient time to accomplish it. If this be true would it not be worth while to reduce the quantity or minutiae of detail in order that what we do teach may later be of real working value? Could we not with profit change from the work of a prodigious feat of memory to a practical and logical process of assimilation? If the teachers in our laboratory branches are too far removed from the clinical viewpoint, it is possible temporarily to assist them by the

help of teachers from the clinical staff. At present there is a vertical wall which separates the preclinical from the clinical years. This applies, not only to the subject matter, but to the personnel as well. A more close association between the teaching staffs would develop and preserve in the preclinical teacher a clinical viewpoint, would assure to the clinical teacher more accurate concepts of the fundamental branches and finally would enable them to work out together the things which are most salient and most practical.—Oppenheimer, R. H.: *Southern M. J.* 19: 704 (Sept.) 1926.

Research by Medical Students

If the advantages of research are so many and so decisive, have we not at least advanced a thoroughly sound abstract argument in favor of training by this method the young but exceptional student? How may we define the broad conception of research? Too many individuals think of it in terms of advanced biology or complicated chemistry. To these the idea is foreign that the "mind unprepared" can observe and hold new facts. They contend that without years of training no one should engage in research. The student, to these obstructionists, is mentally unequipped in fundamental knowledge and in ability to interpret and is thus not ready to take up the problems of the unknown. But I hold that research is a very wide open field and the untrained mind will become trained in doing investigative work. That research requires years of preliminary study, elaborate laboratories and expensive equipment are false and unworthy dicta. On the contrary, we find numerous examples of epochal research performed by men to whom even the term research was unknown; to whom laboratories and costly apparatus were things unthought of. It

has been said that research requires a creative mind, an inquiring mind and energy; a faculty of determining, of grasping and digesting properly certain facts; the ability to originate fruitful hypotheses, enthusiasm and patience, self-denial and perspicacity and, lastly, unbounded energy. Virtues such as these are given to few men, but most men have some of them and can be trained and developed to make up for their lack of the others of these attributes. To the student who wishes to engage in research, energy is an essential. No matter what other virtues he may have, in the absence of energy he is foredoomed to failure. Despite hours conceded to the student, in which he may do extraordinary investigation, he will not be able to do research unless the word "lazy" is deleted from his vocabulary and his understanding. At Tulane we attempt to stimulate the student to do special work by personal encouragement, by concession of hours, by giving a small subsidy to the student who will delay his passage through the medical school for a year or more to engage in teaching and research and, lastly, in their senior year by a course which we have labelled "Medicine by the Students," and which is somewhat allied to the thesis method practiced at Yale, Stanford, Wisconsin and several other universities. In this course the student is assigned or he is permitted to select for himself some phase of medicine to present to the class as a whole. The subjects chosen have to do, as a rule, with some contemporaneous problems or studies in medicine. He is asked to study a patient or a series of patients, or the literature, with the idea of bringing in detail before the student body some of the problems of diagnosis, pathogenesis or therapeutics in which the full details cannot be presented by the teaching staff for lack of time in the ordinary curriculum. The bedside diagnosis of the car-

diac arrhythmias, liver function tests, neutral red in functional gastric disorders, the treatment of heart block, achondrodysplasia, novasural, are a few of the subjects selected for the purpose of illustrating the general trend of the three papers that are presented by the students each Wednesday afternoon. They are allowed fifteen minutes in which to make their presentation, and questions and discussion from the other students are permitted. The literature is consulted fully by the student and bibliographies are required of at least ten references. The originality of the paper, its form and the manner of presentation are all considered in grading the presentation, the grade to play a part in the make-up of the year's average in medicine. Musser, J. H.: *Southern M.J.* 19: 705 (Sept.) 1926.

Teaching of Anatomy

It is still at least as important as it ever was in the past that the student of medicine should acquire an intimate practical knowledge of the territory with which his future work as a physician and surgeon will be concerned. There is only one means of acquiring that knowledge in the way likely to be of practical use; and that is by thorough and conscientious dissection of the whole body, seeing and handling every structure and learning its form and relations rather as visual and tactile images than as verbal symbols written by another man. The medical student, in fact, should learn his way about the body in the same way as a new-comer to a town learns the local geography—not by relying on a guide-book, but by seeing the place. It is a matter of importance, both to students and teachers, that the microscopic anatomy of the body should be taught as an integral part of the subject of anatomy, and that intermediate domain of structure appreciable to the hand lens, an aspect of anatomy so important to

the student of pathology, should not be neglected. Moreover, the student should become practically acquainted with the structure of the embryo and placenta, so as to appreciate how the body is formed and to be able to understand the phenomena of parturition. Anatomy should not be regarded merely as a study in geography, but as a discipline that aims at training the student's powers of observation and giving him an understanding of the meaning of the body and the factors that determine its form and regulate its growth. It should be impressed upon the student that the aim of the study of anatomy is not simply to explore the poor dead relics of humanity on the tables in the dissecting room, so much as to use the opportunities they afford to learn the structure of the living with whom the physician and surgeon is really concerned. Special care therefore should be taken in training the student to correlate the position and relations of every structure in the body with the surface form, and intensive study should be devoted to the surface-anatomy of living models, not excluding the student's own body, and encouraging him even in the early days of his student career to use the laryngoscope and the ophthalmoscope, and any other form of scope to which he can get access, to learn the normal structure of the living body. In particular, the student should be provided with facilities, in the form of an abundant supply of roentgenograms and roentgen ray equipment, for the study of the living body by means of radiology—to learn what the roentgen rays have to teach of the bones and joints, the heart, lungs and diaphragm, the alimentary canal, the kidney, liver, et cetera. This is desirable not merely to train the student to interpret what he sees on the radiographic screen, but to teach him the anatomy of the living body. While the work in the dissecting room should familiarize him with the whole body,

there is a lot of additional work now thrown on the student that is devoid of any really practical value or scientific value to justify the waste of time now spent on it. Every teacher of anatomy ought to be trusted to decide what to jettison to provide time for the more important things which are essential if the dead corpse of anatomy is to be vitalized and made into a living subject. If anatomy is taught as a living subject, it makes a vital appeal to the student's interest as something that affects him personally. When the student enters the wards, it is essential that he should be brought back to the dissecting room for at least an hour once a week for the whole of the rest of his course. What he needs is not so much teaching as the weekly opportunity actually to see the things, the importance of which has been impressed on him in the wards of the hospital.—Smith, G. E.: *Irish J. M. Sc.*, 6:574 (Oct.) 1926.

Teaching of Physiology

The first and most essential part of the teaching of physiology is the theoretical lecture. The second feature of teaching which I would like to stress is research. It makes the student realize that perhaps he, too, may some day be able to advance the borders of knowledge, and in hoping to find what is new have more interest in learning what is old. The great difficulty in all teaching is the inability of the student to apply what he has learned under one title to what he is studying under another. The chief improvement which I would like to see generally introduced is a short course in the application of physiology to medicine for students in their final years. There is little use in a physiologist trying to do this. His knowledge of medicine is at its best a mere memory. Such lectures can be best given by a young physician who still retains connection and interest with physiologic knowledge. I

would stress the main merit of physiology as a training of a preliminary nature in no subordinate sense. It should lead to the development of a spirit of inquiry rather than be only a memorizing of facts of varying grade of authenticity, and the mastering of a few manual tricks.—O'Connor, J. M. : *Irish J. M. Sc.*, 6:576 (Oct.) 1926.

Teaching of Pathology

With a fair knowledge of morbid anatomy and morbid physiology a keen student will quickly learn the essentials of clinical medicine; it will be easier for him to appreciate the rationale of physical signs, and he will more rapidly visualize the changed conditions of the tissues and fluids which are to be met daily at the bedside. If pathology is taught as a separate subject, and treated mainly as a laboratory study, the student may gain the impression that it is merely a new pigeon-hole, an academic subject, and that it must be learned as an exercise and not as the foundation, together with anatomy and physiology, of his whole conception of medicine. There is also the danger, a very real one, that the student who learns without an immediate opportunity of testing the truth of his teaching is very likely to forget. Further, the average student, having finished his course and possibly passed his examination, will have a tendency to think that all that is necessary has been done, and will fail to appreciate that his success as a physician will depend mainly on his insight into morbid anatomy and physiology. Another argument against a preclinical course is that the student may lose invaluable opportunities of following his cases from the wards to the post-mortem room and to the microscope: it is this line of study that makes it

easy for the student to learn and for the demonstrator to teach, it is in this way that enthusiasm, enquiry and research are best engendered. The above arguments seem to demand a course which is concurrent with clinical work and as closely dovetailed with it as hours permit. If time allowed (and without a thirty-six hour day it is hard to see how it could), a short course which would include elementary clinical chemistry, bacteriology and the main principles of inflammation, would be useful as an introduction before entering the wards. The preliminary course could in no way replace a full and thorough course in pathology, which should run concurrently with the student's first year in the wards. An ideal lecture should be a review of the subject, of its literature, of the experimental work that has been carried out and of the various suggested interpretations, colored by the lecturer's personal experience. Far too much time is wasted in the staining and preparation of slides; in many schools the slides are now prepared and stained, and given out ready for immediate examination. A serious flaw in the teaching of pathology is the difficulty of planning and carrying out experimental classes similar to those which are so useful and successful in physiologic teaching. The teaching difficulties, to some extent, arise from the large number of students; if it were possible to have, let us say, ten students and five necropsies a week, so that each pair could have one subject for thorough and detailed study each week, as well as ample opportunity to see the work of the other four groups, a far more efficient training in observation and investigation would be attained, and the student would carry away more useful information than many hours of routine lectures could inculcate.—Stokes, A.: *Irish J. M. Sc.*, 6:578 (Oct.) 1926.

Teaching of Bacteriology

Anyone who has had to teach medical bacteriology to students will agree with me when I say that the elementary principles of the subject should be imparted by the botanist. The student should be able to distinguish between bacilli, cocci, yeasts and moulds, he should be capable of making and interpreting hanging-drop preparations and be able to prepare and stain films with a simple aniline dye and examine these preparations with an immersion lens. Having next passed his examinations in anatomy and physiology, he is ready to proceed to the study of pathogenic bacteria. The ideal arrangement would be that instruction on the pathogenic organisms and on immunity should be given simultaneously with the lectures on infective conditions in the pathology class, and before this subject is dealt with by the professor of hygiene. In University College, Dublin, the student takes out his lectures on pathology, bacteriology, and hygiene in his third year. At the beginning of the fourth year a course of instruction in clinical bacteriology is given before the student goes into hospital as "resident." Here the student learns how to apply the knowledge of bacteriology already obtained in the work in the wards of a hospital. A course in clinical pathology is given at the same period. The hospital laboratory should be in the charge of a competent and sympathetic pathologist, who would guide the footsteps of the beginner, encourage the eager student, and give adequate facilities to the man who wishes to probe deeply.—O'Kelly, W. D.; *Irish J. M. Sc.*, 6:582 (Oct.) 1926.

Teaching of Pharmacology

Pharmacology, as corrected by experience in the treatment of the sick, is the basis of therapeutics. The first step must be, therefore, a course

of practical experimental pharmacology. The student must see with his own eyes that such a drug produces such an effect, and he must see, in as far as is possible, exactly how the effect is produced. The extent of this course in pharmacology must depend largely on the resources, as regards equipment and personnel, of each school. In the best equipped school the class engages in a serious practical course, in which each student carries out a series of experiments under supervision, just as he would in a class of practical physiology. He must become familiar with the pharmacologic action of the several groups of important drugs. But the teacher must not be content with merely teaching the principles of pharmacology; he must constantly give a practical turn to his discourse by therapeutic reference. He requires therefore, to be not only a pharmacologist, but a clinician of experience and judgment. The teaching of therapeutics must be a blend of scientific principles with empirical knowledge. Of necessity the student must learn something of the more important individual drugs. He must know the preparations and doses of those in common use, and more particularly of those of which an overdose would be dangerous. Most of the necessary details of *materia medica* are better learned from books than from lectures, and the lecturer can do little more than direct the attention of his students to the drugs which demand special study. The correct use of remedies assumes a preliminary sound knowledge of chemistry, and the student must be taught to apply this in reference to the safe and elegant combination of drugs. His attention must be drawn to the pitfalls into which he is most likely to stray, and he must be led to understand the chemical phenomena of the various forms of incompatibility that he is likely to encounter. Finally, he must learn how to write a prescription, and

that it is better he should write it in good English than in bad Latin.—Rowlette, R. J.: *Irish J. M. Sc.*, 6:583 (Oct.) 1926.

Teaching of Clinical Medicine

In my opinion, hospital work should be started at the beginning of the second year, provided that the course of five years dates from the time when the preregistration examination has been passed. The great advantage of starting early is that it focusses the attention of the average student at once on the fact that all his studies are directed with the intention of enabling him to diagnose and to treat sick persons. The course in the second year should indeed constitute a sort of link between the laboratory and the ward. The teacher should remember that the student knows little anatomy and little physiology; he should therefore concentrate his attention on the demonstration of the normal and on the elucidation of normal physical signs. Surface anatomy in particular should receive special attention, for in the crowded years that follow it is not possible constantly to hark back to elementary principles. The elementary principles. The elementary course should be a short one, an hour a day for three or four months being quite sufficient, and then the student should abandon hospital until the beginning of his third year. During the third and fourth years, repetition is all important; the symptoms and signs of ordinary diseases should be dealt with again and again. Medicine should be taught as a whole. The General Medical Council has recently issued recommendations suggesting that special courses should be given in diseases of children, on tuberculosis, on venereal disease, and many other subjects. This is a profound mistake. It is all right for the post-graduate to take out a special course,

and to be taught by specialists in any subject he desires, but for the undergraduate, it is far better that he should see cases in much the same way as he will encounter them in after life. In the ordinary course of hospital work it is possible by a little management to bring the student practically over the whole course of clinical medicine, and thus to enable him to get a wide general outlook concerning disease in general. He will thus be prepared to deal with every case in the future with an open mind, and realize, for example, that a patient who primarily appears to be a gastric case may be suffering in reality from a lesion of the nervous system or vice versa. Students should be early taught to realize that clinical day-to-day observation is far more important than any laboratory tests. There is a great tendency at present for students and even for qualified medical men, to place more reliance on the information obtained from laboratories than on what they can see and feel for themselves. Laboratory tests are indeed viewed with a certain amount of awe, and the results are received with reverence. The student often thinks that these tests are infallible, though very difficult to learn, and that clinical observation is a matter of little importance in comparison; and further thinks that the facts revealed by the wards can be picked up quickly and with little effort. There is no greater mistake in the whole of medicine; a single look at a patient will often tell a man who has taken the trouble to study his cases more than all the tests in the world. In spite of my profound admiration of laboratory workers, and the knowledge that most of them are men of high ability, I feel convinced that less thought and less intelligence is required to carry out this work satisfactorily than is demanded from the practitioner in the management of any but the most ordinary cases. At the outpatients

clinic, rapid diagnosis, rapid decision concerning treatment, rapid recognition of what is trivial and what is serious, in short, resource in general, is acquired. The student can here also be given a certain amount of responsibility by directing him to examine cases, and can form his own conclusions, and make up his mind as to what treatment is necessary. Supervision is, of course, required, and in every case the student must be asked to state definitely the reasons that have led him to any conclusions he may have formed. In the wards formal lectures undoubtedly have a place, and are of particular value when delivered by experienced teachers. As soon as the clinician has forgotten what is contained in the text book and has begun to teach what he has himself learned from his experience he has become a most valuable asset to a hospital staff. Apart from a formal lecture, walking around the wards with one's clinical clerks is obviously important. Many a student thinks that it is waste of time, and perhaps from an examination point of view it consumes more time than at first sight seems desirable, but unquestionably observing the methods of a skilled clinician and listening to the casual remarks which he occasionally drops, all bear fruit in after life. It is almost unnecessary to lay stress on the importance of regular note-taking. Every student should be compelled to take notes dealing with the history, the symptoms and the physical signs of his patient, because it is only by doing so that systematic methods of thought can be inculcated and that he can learn, in the words of the aphorism, "to make his patients his books." Apart from their educative value, notes of course are often of extreme use when patients are readmitted to hospital, perhaps after a lapse of years. In all clinical teaching it is important to endeavor to link up physiology, pathology, biochemistry, etc., with one's

work and to show how one borrows from each of these subjects in order to arrive at a correct diagnosis. At no time in a student's career should he be permitted to look on any subject as contained in a water-tight compartment. He should be taught to realize how one borrows in all the primary subjects and indeed from one's knowledge of life in general in order to solve the varied problems that the wards present. All students after graduation should be encouraged to go for a time to some other hospital and to see the methods of other teachers. In this way the outlook is at once broadened, and the student is finally equipped to deal skilfully with his life work.—Moorhead, T. G.: *Irish J. M. Sc.*, 6:586 (Oct.) 1926.

Teaching of Surgery

The teacher of surgery must recognize as a first principle that all elaborate detail of diagnostic and operative technic is cut with the province of the medical student and that with increase of knowledge a simplification of teaching is required. The hospital must inevitably be the main training ground in surgery. The surgical lecture should be introductory and complementary to the hospital teaching, and should have as its basis, no less than the latter, training through the senses and deduction from facts observed. It should enunciate and illustrate the main principles on which surgical practice is based, and supply that knowledge of pathology which is the first essential for intelligent clinical diagnosis. In Edinburgh, the student commences his surgery in his third year with an introductory course of fifty lectures and demonstrations on the principles of general surgery. Such lectures are given in the university buildings, and might be termed lectures on applied pathology. The problems of injury and disease, with which the student will be confronted on his entry into

the hospital, are discussed on general lines, and demonstrations of naked eye and microscopic specimens illustrate the course. The student is encouraged to read one of the many excellent text-books on surgery which are now available, and to regard the lecture merely as explanatory and supplementary to his reading. Note-taking is, therefore, not encouraged, but it is largely practised, for the student dearly loves his notes. The first introduction to clinical training takes place in the outpatient department of the hospital, where a three months' course of practical instruction is given. Here the student is shown numerous examples of injury, deformity, infection, ulceration and simple conditions requiring minor operative measures. He is trained in the essentials of antiseptic and aseptic technic, in the dressing of clean and infected wounds, in the diagnosis and treatment of fractures of the upper extremity, and is made responsible for the dressing and care of a group of patients. This part of his training we regard as most important, and it forms one-third of his course of clinical surgery. The essence of the hospital training must be intimate contact with sick people. Each student is allotted certain cases of which he must take full notes, but in addition, to each of several small groups of students a number of beds is allotted, and the condition and progress of all patients occupying these beds must be familiar to the members of this group. One hour a day must be allowed for the taking of cases and the observation of the progress of the patients in the wards. Students must be encouraged to study the patients from the point of view of prognosis, to become familiar with the aspect and the complaints of the really sick and of the recovering patient, in short, to acquire, what can be gained in no other way, the "clinical instinct." At this stage of the course a few lectures on surgical

anatomy and surgical physiology are of great value, and bridge the unnatural but very real gap which so often exists between the preliminary scientific and the clinical branches of the curriculum. In his fourth year, either before or during his third term of clinical surgery, the student is given his second systematic course of fifty lecture-demonstrations on surgery. This covers the whole field of systemic surgery. Here again the lectures must consist merely in the exposition and in the demonstration of the essential facts of knowledge acquired by reading and clinical observation. By demonstrations of naked eye and microscopic specimens the student may acquire the salient pathologic features of the diseases the clinical features of which he has come to know from his reading or from his hospital work. The third session of clinical surgery is taken after the lecture course on systemic surgery. Special facilities are offered him to attend emergency operations and to correlate clinical pictures with operative findings in such cases. He is given the opportunity to observe the technic and procedure of special investigations, such as cystoscopy and pyelography, that he may learn what can be determined by such methods and in what cases they are necessary or advisable. By attending operations in the surgical theatres of the hospital and by participating in a certain number of operations, the student will acquire a knowledge of the anatomy of the living subject if this be demonstrated systematically, and will learn to share the responsibility with the surgeon for the asepsis of any operation in which he may take part. By attending emergency operations and during vacations many undergraduates acquire an extensive experience and become most efficient anesthetists. In my own unit the vast majority of anesthetics are given by students, and very seldom have I any cause for complaint or anxiety.

The importance of tutorial instruction, both in connection with the class of systematic surgery and with the ward work, can hardly be overestimated. The keeping of a record of the class work of each student throughout his whole surgical course is found to be a much more valuable index of his fitness to qualify for a degree than his behaviour before examiners at a single and final test.—Wilkie, D. P. D.: *Irish J. M. Sc.*, 6:590 (Oct.) 1926.

Clinical Clerkships in Medicine

Eugene F. Du Bois and Paul Reznikoff, members of the faculty of the Cornell University Medical School, describe (*J.A.M.A.* 87:542 [Aug. 21] 1926) the work done during the month spent by their students in the Second Medical Division of Bellevue Hospital. This forms only one-half of the total period of medical clerkship. The students have already received the usual training in medicine during the second and third years and they are supposed to be familiar with the methods of physical diagnosis and clinical pathology. There is more than enough material for each section of ten or eleven clinical clerks, and only the most instructive cases are assigned to the students. Each man studies in detail from ten to fifteen cases.

On the morning that the clerks first arrive, the director of the division takes them to the hospital office, where they register as official members of the house staff with certain duties and responsibilities. Then they are given complete sets of instructions, and the director then spends about an hour in explaining the general principles as well as the details of the work. Each student is required to submit at the end of the month ten complete charts.

The clinical clerks report for work and sign a book in the laboratory at 9 o'clock every morning. They are supposed to finish at about 5 o'clock,

but usually work later either in the wards or in the library. Ward work occupies the time until 11:30 in the morning. Then while the patients are taking lunch, the clerks go to the ward laboratory and make their blood counts and other tests. During this hour, conferences may be held dealing with such subjects as coma, edema and methods of medication. Mondays, Wednesdays and Fridays, the clerks either make formal ward rounds with two part-time clinical professors, or else attend in another part of Bellevue Hospital a tuberculosis clinic.

Perhaps the most important of all is the casualty conference held every Tuesday afternoon. This is conducted by the director of the service, who thus checks the diagnosis and treatment of every patient who has been the subject of an operation or necropsy during the preceding week. The house physician reads a summary of each case. The students, if they have not seen or heard about the necropsy, are then asked for their diagnosis. Next, the members of the staff who have not seen the patient are asked to make diagnosis from the description given by the house physician. After that, the diagnoses made on admission and throughout the patient's stay in the hospital are read from the chart. Finally, the pathologic intern reads the necropsy findings and shows the organs. In checking up the diagnosis, it is often found that the most accurate estimate has been made by the house officer or the clinical clerk. The students are impressed with the great chances for error in diagnosis that may occur even when patients have been carefully studied by experienced clinicians. They see that their instructors are willing and eager to go on record in public in order that each may benefit by his mistakes. No clinician's reputation for infallibility lasts through more than three conferences, but his reputation for honesty waxes as the other wanes. Every effort is made to

wean the student from the pernicious idea that a diagnosis must be correct because one of his professors has given it the weight of his authority.

At this conference, there is also a good opportunity of checking the results of operations and the interpretation of roentgen-ray films. An effort is made to show the clerks the necessity for reading their own roentgenograms and not becoming dependent on the diagnosis of the roentgenologist.

Each clinical clerk is expected to hand in one case report every week except the first. The subjects for these papers are selected by the men themselves, but they are urged to pick out something connected specifically with one of their patients yet based on one of the fundamental preclinical sciences. Having selected titles of the papers, they search for information in the library, using the various indexes, consulting original sources and avoiding, according to our specific instructions, all predigested material found in textbooks or systems of medicine. A dozen or so original articles are then reviewed, and a paper of five or ten pages is written with a short bibliography attached.

Each one of these papers is then read by an instructor and a good deal of time is spent discussing with the students the material and manner of presentation.

An effort is made to teach the clerks how to distinguish between reliable and unreliable work, and the librarian is instructed to help them find not only work that is good but also work that is bad. The responsibility is the clerk's to distinguish between the two.

The student clinic, the third method of self instruction, is held every Thursday afternoon and it lasts an hour and a half, which is about time enough to present four cases. It takes the place of grand rounds, that unwieldy method of instruction usually designated as "shifting dulness." It

is much more comfortable and easier on the feet to have the patients wheeled into the clinic room. Each clerk is allowed eight minutes for the presentation of his case. This means that he must eliminate all unimportant and negative data and select from the mass of material those things which are essential. The director of the service presides at the first three of these clinics. The last clinic is turned over entirely to the students, who select a chairman, arrange a program, present the cases and conduct the discussions, inviting anyone they choose in the city to participate. These are by all odds the best of the clinics. No time is wasted; no one attempts to talk for more than a few seconds after he has received a warning signal from the student chairman. In the preparation of the discussions, there has been not only a search of the recent literature, but also many interviews with the heads of the preclinical departments, which deal with the principles involved.

At the end of the month an experience conference is held, and the clerks are asked to criticize the course and suggest improvements. Many of the ideas presented at these conferences have proved very helpful and have been incorporated into the course. This meeting also serves as a clearing house for ideas on education and hospital internships, and has a distinct value in promoting better understanding between the instructors and the students.

RULES FOR CLINICAL CLERKS

1. Clinical clerks' charts, except when in use, should be attached to the bed near the hospital charts.

2. When a case is assigned, take the history at once and write it on a hospital history sheet and attach it to the hospital chart. As soon as a member of the visiting or house staff gives it his written O. K., it will become part of the hospital records. . . . If you are assigned a case in which

a history has already been recorded, make a history of your own and attach to your chart. Take a blood pressure reading after taking history and record it on the temperature sheet.

3. Next make a complete physical examination and record it on your chart at once. Use stamps to record chest findings. Write your provisional diagnosis immediately after the physical examination is performed.

4. Laboratory work should be recorded on the hospital temperature sheet or continuation sheet immediately as well as on your own chart. When you need specimens, request the house physician or junior to write the necessary orders in the book. The reaction of the urine is determined by the indicators provided for the purpose (methyl red and phenol red). In doing a differential count at least 200 cells must be counted, and every type of cell must be included in your classification.

5. Follow-up notes must be written on every case as often as indicated—daily in acute cases, at least twice a week in all cases. These should include notes on patient's condition, previous night's rest, temperature, pulse and respiration, change in physical signs, medication, diet, fluids, therapy, etc. Check up your notes with those on the nurse's sheet (blue sheet).

6. Prescribe medication and diet for each case and change prescription as indications arise. Make your own prescriptions complete and detailed—include dosage vehicle, etc., just as though your patient were to receive it in your office.

7. Ten complete cases (including discharge or summary notes) must be handed in before the service of each clinical clerk is completed.

8. Attendance at postmortem examinations of patients seen by students takes precedence over all other work except ward emergencies.

Standardization

We are tending to become a standardized country, and it is perhaps on standardization that industrial progress is founded. But standardization of our educational systems is apt to stamp out individualism and defeat the very ends of education by leveling the product down rather than up. The more really important qualities of people are quite beyond pigeon-holding, quite beyond measurement by scales, tape, or mental tests, quite beyond rating by any known system of examination, all of which fail in giving us an estimate of that most essential of all qualities, personality.—Cushing, Harvey: *J.A.M.A.* 87:541 (Aug., 21) 1926.

The Curriculum in Tropical Medicine

The contents of a course in tropical medicine in an American medical school will naturally depend on the general educational objects of the school. It may vary from a full department with a full-time professor at its head to a series of occasional lectures, optional or cultural in their purpose. The type of physician the school aims to produce and the medical needs it aims to fulfil for its students are the deciding factors in the allocation of time and the selection of subject matter.

At Stanford, there is offered in the department of public health and preventive medicine a course of twenty-two hours, which is designed to give the student a knowledge of the incidence, means of spread, diagnosis, control and prevention of those diseases of hot climates which are encountered in the United States. In addition, it is sought to build up a background of appreciation of tropical sanitation and hygiene, of geographic and climatic influences, of the actual disease problems demanding solution, and some acquaintance with the racial problems involved.

The subjects included are:

1. Intestinal parasites, especially protozoa, vermes, trematodes and dysenteries.
2. Epidemic diseases: cholera, plague, yellow fever, dengue.
3. Filarial infections.
4. Malaria.
5. Climatology, human geography and epidemiology.
6. Avitaminosis, especially beri-beri, scurvy and pellagra.
7. Sprue.
8. Yaws.
9. *Leishmania* infections.

This course is supplemented by a concurrent laboratory course of twenty-two hours in which practical technic is perfected, parasites are demonstrated, and ordinary parasites are discovered and identified.

The course in tropical medicine uses a standard textbook with assigned readings in the library and reviews from current tropical literature. Recitation, discussion, lecture and clinical demonstration are intermixed. Later, as well as during the course, the students see and study the diseases discussed as they appear in patients in the outpatient clinic and the teaching wards. In the laboratory, each student learns for himself to discover and identify the common parasites.

A survey of the catalogues of most of the seventy-one class A medical schools in the United States gives some interesting information. Most of the Southern schools devote definite attention to tropical medicine. Several of the older, larger, better known schools have developed full departments as at Tulane, or separate schools of tropical medicine and public health as at Harvard and Johns Hopkins. Most are represented by single courses in tropical diseases, and these are given when clinical material is available. The trend toward increasing the time allotted and toward recognition of the subject as such is definite. In several schools, gradu-

ate courses are offered or a short, intensive, full-time course. In this connection, note should be made of the rapidly increasing number of laboratories not connected with medical schools that are featuring tropical diagnosis and parasitology.—Alfred C. Reed: *J.A.M.A.* 87:548 (Aug., 21) 1926.

New Type of Examinations

Mather Cleveland (*J.A.M.A.* 87:550 [Aug. 21] 1926) reports the results of the new type of examinations, as distinguished from the old or essay type of examination, which were tried out in the departments of pharmacology, anatomy and orthopedic surgery in the College of Physicians and Surgeons of Columbia University. It is evident that all concerned, both instructor and student, were well pleased with these examinations. They not only measure breadth of information better than the old type, but also measure reasoning power or ability more fully and in less time.

Objective forms of questions seem to be as well adapted to the measurement of achievement in medical courses as in the average college course.

Each of the nine forms of questions tried out in this experiment have considerable validity for medical school courses. The most effective seem to be the standard forms—true-false, completion and multiple choice; but with more adequate trials, the tabular forms of questions may prove to be as good as, or better than, the standard forms, particularly for certain aspects of medical work.

The reliability and validity coefficients of the objective examinations described in this report are two or three times as high as those of much longer examinations of the old type in the same subject matter.

The objective examination measure "reasoning ability," as defined by the criteria now used in the College of

Physicians and Surgeons, more accurately and more reliably than old type examinations of equal or greater length measure it.

The reliability and validity of medical college grades based on old type examinations have been found to be entirely inadequate. Our results confirm those of other investigators. The first year of medical school work predicts second year work no better than high school average marks predict college success.

The adaptability of objective forms of tests to medical school work demonstrated by this experiment suggests the hope that eventually there may be derived a series of objective, reliable and administratively convenient examinations on the common essentials of the medical curriculum, which will be universally applicable and which will afford accurate measures of defined achievement expressed in comparable and universally meaningful units. Such measures are prerequisite to the constructive educational guidance of students and to certain types of long needed research in medical education. As in all other educational institutions, the first duty

of the medical college is not to teach but to learn students—to learn whether they belong in medical colleges, and if so, what specialties they might best pursue, if any. That this first duty has not been satisfactorily discharged by higher institutions generally is indicated by the high and increasing academic mortality rates in our colleges of liberal arts, of engineering, of law, etc. The traditional examinations have not merited the confidence which we have reposed in them. The objective forms of tests will by no means furnish panaceas for all the maladjustments in our educational system; but that they are capable of giving us more exact and more meaningful information about our students than the traditional examinations has been demonstrated beyond reasonable doubt.

This method or type of examination was discussed fully in a paper read by Mr. Trabue of the School of Education of the University of North Carolina at the October, 1925, meeting of this Association and which was published in the volume of proceedings.

